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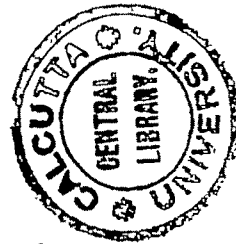
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THE IMPACT OF ATOMIC ENERGY

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CARL KELSEY

1870-1953

ON October 15, 1953 Dr. Carl Kelsey passed away after several years of ill health. Born in Grinnell, Iowa in 1870, he was more than eighty-three years of age at the time of his death. From 1906 to 1941 he was a professor of sociology at the University of Pennsylvania, and since the latter date was a professor emeritus. He was the author of *The Negro Farmer* (1903) and *The Physical Basis of Society* (1916 and 1928).

Members and friends of the American Academy of Political and Social Science will recall his prominent association with the Academy. He was its secretary from 1906 to 1912, and since 1912 has been a vice president; was special editor of eight volumes of *THE ANNALS* from 1914 to 1923; and was the first person to be awarded an Academy Research Fellowship. As the recipient of this award he spent nine months in Haiti and the Dominican Republic, preparing a study entitled "The American Intervention in Haiti and the Dominican Republic," which appeared as a supplement to *THE ANNALS* of March 1922.

Throughout his life Dr. Kelsey was remarkable for the number of his friends and for their devotion and admiration. The Academy has suffered a great loss, and expresses in this most inadequate way the deep regret felt by the Officers and Directors and through them that of all the members.



Atomic Energy and the Democratic Process

By ROBERT A. DAHL

TO say that we have not yet discovered how to deal with atomic energy through democratic political processes may at first glance seem to be one of those pieces of dramatic and misleading hyperbole that are regularly invoked, unfortunately, in the attempt to discuss the social impacts of this new force. After all, the arrival of nuclear weapons, and in the United States the creation of a gigantic government-controlled industry to produce them, have assuredly not pushed us to the edge of dictatorship. Despite the shrill warnings of science fiction, the small group of Americans who initially make our atomic energy policies are quite patently not imposing a tyrannical will on a terrified public. What is more, as Senator Jackson shows in this volume, a body of popularly elected laymen in the Joint Congressional Committee on Atomic Energy exercises control over policy to a degree that is probably unique in congressional-executive relations.

Yet as a plain statement of fact, the proposition is scarcely debatable: the political processes of democracy do *not* operate effectively with respect to atomic energy policy.

To say so much is not to pass a moral or practical judgment on the fact. By the standards of anyone save a doctrinaire and utopian partisan of democracy, the political solution we have arrived at for atomic energy policy quite possibly may be preferable to a larger degree of democratic control. The difficulty is that so few of us can appraise the consequences of the various alternatives.

THE DISTINCTIVE FEATURES

As with so many other aspects of atomic energy, it is as easy to exaggerate the difference as to underestimate it. Once we get outside the models of the democratic theorists to the political life of the real world, we discover that polities which we in the West call democratic are in fact systems in which most policy is determined by a relatively small number of people. These people, leaders of one sort or another, act within ill-defined boundaries set by a "general" public—really a network of publics—that is passive and acquiescent except when its boundaries of tolerance are invaded, or at least when some leaders convince the "public" that this is so. Many individuals normally in the "general" public move into and out of the decision-influencing group whenever some particular type of policy is involved—farm prices, say, or labor legislation or copper imports or a local harbor improvement. At this point hitherto inactive individuals may become leaders in pressing for some line of policy, or—more likely—"attentive" citizens who follow this particular series of events with close attention and even some readiness to act in various politically relevant ways.

Hence when we say that the political processes of democracy do not operate with respect to atomic energy policy, we refer not to the fact that broadly dispersed popular control is lacking, but rather to these distinguishing characteristics: (1) Some of the consequences of atomic energy policy are of incalculable importance to the most highly

ranked goals of almost every individual. (2) The policy-making elite is *significantly* smaller here than with most other policy of comparable importance. (3) Outside this tiny elite, as Drs. Douvan and Withey show in their article, the "general" public are ill informed, passive, and acquiescent to an extraordinary degree considering the importance of the policy to them. And (4) the practice of secrecy makes it exceptionally difficult for attentive leaders to activate members of the general public who, in the absence of secrecy, *perhaps* could and would be activated as attentive citizens.

This last point is worth stressing. For, as Mr. Palfrey shows below, in surrounding atomic energy decisions with secrecy we have departed from a traditional way of meeting problems, without ever really debating the wisdom of this departure. It is not easy, as Mr. Palfrey warns us, to strike a balance: those who react adversely to secrecy often propose utopian alternatives. Yet it is perhaps time that we in the United States should begin to weigh the consequences of secrecy and at least to raise the question whether the probable costs may not exceed the probable gains, at any rate given the present forms of secrecy. Let us consider some of these costs.

COSTS OF SECRECY

1. Elite rule is an inevitable by-product of secrecy. Those who effectively influence policy can scarcely exceed the number of those who possess the information to act.

2. Insofar as this is not true—that is, insofar as individuals without valid information are activated and make their influence felt—irrational policy will probably result. This kind of irrational policy-making might happen if war should abruptly threaten the conti-

mental United States; an ill-informed public (ill-informed partly because the issues had never been openly discussed) might then from sheer panic force measures of attack or defense that would be catastrophic.

3. It is even possible, as Professor Wolfers suggests in this volume, that secrecy concerning our war strategy with respect to the bombing of urban populations increases rather than decreases the probability that our own cities would be bombed.

4. The need to protect secrets has required a program of investigating and screening individuals for "security," of proportions that a decade or so ago would surely have been regarded as an unjustifiable invasion of personal liberty. The Atomic Energy Commission, as Professor Brown shows below, has handled this program with admirable restraint; but as he also reveals, the program is not without its quota of injustices.

5. Perhaps most important, the need to protect "the secret" has contributed to a jittery climate of public opinion—at least among some influential publics—that seems to foster suspicion, distrust, fear of heterodoxy, support for a variety of measures of public and private repression, and the enhancement of the power of leaders who manipulate these sentiments.

One is tempted to add as a sixth consequence a certain amount of handicapping of research in the natural and social sciences; but this is a problem too complex for simple generalizations, and one would do better to read the careful analysis by Mr. Meier and Dr. Rabinowitch below.

In any case, the institutionalization of secrecy has concentrated, in the hands of a few people, control over decisions of a great magnitude for the values of a larger number of persons than in all

probability were ever affected by any old-fashioned authoritarian leader.

The main case in point is, of course, the mixed question of military strategy and civil defense. This issue of *THE ANNALS* was to have included a discussion of the impact of nuclear weapons on military strategy, by Dr. Bernard Brodie, one of this country's creative scholars in the field of military strategy. Because of his association with the Air Force, both directly and through the RAND Corporation, he was required to submit his contribution to the Department of Defense for security clearance. Unfortunately, the appropriate officials declined to clear it for publication. The incident illustrates one of the dilemmas created by secrecy. Those of us who do not have access to secret information cannot, on some issues, assess the alternatives intelligently; whereas those of us like Dr. Brodie who do have access to secret information may thereby be prevented from discussing the alternatives publicly—alternatives, by the way, that deeply concern our own lives and those of millions of others.¹

Alternative policies of great import are undoubtedly being debated at present within the tiny policy elite that controls decisions. Enough information leaks to the public to indicate that debates are taking place, and to some extent even what the debates are about; but not enough information comes out to enable us to appraise the alternatives, or even to know what they are.

SOME OF THE ISSUES

Some of the issues, surely, are those raised by Professor Wolfers and Dean

¹ An article on raw materials by Mr. John W. Landis was also to have appeared in this issue. Mr. Landis, until recently employed with the Atomic Energy Commission, submitted his article to the AEC, and at the time this volume went to press, the article had not been released by the AEC.

Cavers below. What general categories of targets on this continent and in Europe should be most heavily defended? And how? Dean Cavers shows some of the disastrous economic consequences that would ensue if a few of our cities were bombed, and indicates how little preparation we have made to head off these consequences. Professor Wolfers argues that precisely because the consequences of bombing large cities would be so enormous, the fear of retaliation reduces the probability that either side will bomb urban centers. Should we nevertheless prepare for the worst possibilities? How costly would such preparations be? Are our political leaders, in order to satisfy pressure for balancing the budget, underestimating—unconsciously perhaps—what needs to be done to build up civil defenses?

No one will deny that these are important questions. In view of the breakdown in international negotiations for controlling nuclear weapons, and the dim prospects of fruitful bargaining portrayed by Mr. Frase below, they are also immediate questions. The fact that a thermonuclear reaction is now known to have occurred in the Soviet Union on August 12, 1953 means that the time is approaching when that country will commence its stockpile of hydrogen bombs. Questions about the adequacy of our present plans for civil defense, then, are as fateful as any this country is likely ever to face. Yet they are questions which the attentive citizen cannot hope to answer. More than that, he cannot even know whether he should demand enough information from his officials to try to answer these questions. He has, then, delegated control over the survival of himself, his family, his neighbors, his fellow citizens, his nation, and a not inconsiderable portion of mankind to remote public officials, without having had much opportunity

to examine whether such extensive control is entirely necessary. The political mechanisms normal to a nation at war have to this extent displaced "democracy" even in the limited sense defined above.

SHALL PUBLIC EXAMINATION TAKE PLACE?

Let it be said again: Given the various alternatives, the present method of policy-making may be the most rational we can adopt. If so, we had better learn to accept it with the calm of the Stoic or the practical understanding of the pragmatist, as Dean Leys advises in a slightly different context below. But before we accept a fundamental alteration of our policy-making process—one far more drastic than the wildest dreams of any of our constitutional reformers ever envisioned—it might be well to conduct a more extended public examination of the issue than has so far occurred.

Yet how can this public examination take place? Here we approach the heart of the dilemma alluded to a moment ago. The pros and cons of secrecy cannot be evaluated abstractly. Probably most of the costs can be surmised. But can anyone who is not privy to official secrets rationally estimate what we are gaining by our secrecy? Furthermore, the problem is evidently not one of weighing the abstract pros and cons of secrecy in general; rather, as Mr. Palfrey points out, what is required is a whole series of judgments about secrecy measures of a particular kind or degree applied to some specific activity. Because of this need for a detailed examination, can anyone who does not already know what is secret intelligently discuss and pass judgment on the probable consequences of some alternative arrangement?

At first blush it might appear that the only possible answer is No. If that be

so, then there can be very little intelligent public examination of the secrecy problem. Those of us outside the small elite that makes atomic energy policy would then be well advised merely to urge that body of leaders constantly to re-examine the question among themselves, behind closed doors. We could hardly do more without fostering irrational disclosure. We would, then, not only delegate the secrets to the policy elite; we would *in fact* also delegate the final and unreviewable power to determine what should and should not be secret.

COMPETENCE OF AN OUTSIDER

Although this is substantially the existing state of affairs in atomic energy, it need not be. As a practical matter, individuals who do *not* know the substance of secret information can in many instances make an intelligent appraisal of the costs and gains of secrecy. Does it require precise knowledge of the nuclear stockpile to appraise intelligently the relative gains and costs of disclosure? Those who know the secret data can be required to explain in some detail what consequences they believe might ensue if the data were made public. It is not necessarily beyond the grasp of an outsider to appraise the validity of these statements about the alleged consequences and to compare the alleged gains with some of the known costs.

Hence it should be possible to have top policy-makers conduct a public discussion of the present dimensions of the secrecy problem and the various alternatives to it. And if secrecy could thereby be reduced, some of the alternative policies now debated within a restricted group (for example, the requirements of a program for coping with an atomic attack against this country) could be discussed among a somewhat wider public.

To be sure, it would be utopian to expect that large numbers of individuals would engage directly in such discussions or even participate indirectly as members of the attentive public. As we have already said, large numbers of individuals are rarely involved in deciding *any* public policy. What distinguishes the normal operation of our political system from its operation with respect to atomic energy is not primarily the difference in the numbers of individuals involved, although this is an important factor. The essential difference is that, normally, nongovernmental leaders can learn something about the alternatives to existing or proposed policy; and by activating sections of the public they can help to determine policy. Realistically speaking, this is not possible with most aspects of atomic energy policy at present.

THE INDUSTRIAL FIELD

There is, however, one important area where a more nearly normal operation of policy-making might be possible—that is to say, where secrecy is no longer a major determinant. This is the use of nuclear reactors for the production of electrical energy. Here, as several of the succeeding articles indicate, the secrets that present obstacles are mostly those classified by Nature, and they can be declassified not by fiat but only by research and experience.

Very roughly, the possible lines of policy here turn on at least two “techno-economic” alternatives and at least four administrative alternatives, or at least eight combinations in all.²

The two techno-economic alternatives are the dual purpose and the single purpose reactors. Adoption of the first would mean that reactors built to produce electric power would also produce plutonium for the United States Gov-

ernment and its bomb program. Following the second alternative, reactors for power would be designed to maximize the output of heat in a form usable for producing electricity, and plutonium would not be produced for the bomb program.

Choice between these two alternatives turns not simply on technological questions, but also on economic ones. Thus the dual purpose reactor might well provide a method by which the government would bear enough of the capital and operating costs of the reactor to bring the price of power within an economically feasible range. But because the allocation of costs would be to some extent arbitrary, under this program cheap power *might* result, in effect, from a government subsidy to power consumers. Moreover, there have been hints from the AEC that our supply of atomic weapons may shortly approach a point at which it would be wasteful for the government to agree to any long-term purchases of plutonium. Mr. Cisler argues below for the dual purpose reactor, and Dr. Weil presents the case for experimenting further with single purpose reactors.

ADMINISTRATIVE ALTERNATIVES

The four administrative alternatives are, roughly, (1) operation and control of the reactors and their output by the government, following the analogy³ of the Tennessee Valley Authority and reclamation dams; (2) operation by private industry under government contract, and control by government over price, output, location, and other key decisions; (3) operation and control by a mixed nonprofit and governmental group, primarily for experimental purposes, as proposed by Mr. Weil; and (4) operation and control by private industry, as proposed by Mr. Cisler.³

² This of course represents a vast simplification of the alternatives.

³ It is worth emphasizing again that to reduce the alternatives to four is to oversimplify.

Spokesmen for industry range themselves on the side of the last alternative, although there are some interesting and important variations of detail in their proposals. At present, indeed, some form of the fourth alternative seems to be the only position that has much possibility of generating any significant political support within the relatively small group of individuals who will make the final decision. Hence the last alternative (probably based initially on the dual purpose reactor) is the one most likely to be adopted.

It is difficult to say whether this alternative would be adopted if there were a wider discussion of all the alternatives than is taking place. In any case, the other alternatives probably would not be so vigorously championed by groups equally effective politically. Thus in the one area where secrecy is not a genuine bar to the investigation

The range of alternatives is great. We have left to one side the question of alternative forms of ownership of the reactors. Various possibilities have been suggested. But the critical questions turn on operation and control; for the most part, ownership is relevant only to the extent that it is a condition for operation and control, including control over the disposition of earnings.

of alternatives, it is likely that policy will still remain the product of a rather tiny group of leaders, that the alternatives will not be examined except within this small group, and that sections of the public that in different circumstances might be activated in favor of other alternatives will remain inactive.

A NOVEL SITUATION

Thus, secrecy or no, atomic energy seems to present choices that defy wide popular understanding and control. So far, the control of such decisions is a kind of indigestible element in the operation of American democratic politics. In this respect, the atomic energy operation aptly symbolizes an era in which the opportunities for popular control have generally dwindled. To be sure, the unusual extent of elite control so far offered by atomic energy may be no more than a passing adjustment to a novel situation by an essentially vigorous and healthy democracy. But atomic energy appears to be one of a growing class of situations for which the traditional democratic processes are rather unsuitable and for which traditional theories of democracy provide no rational answer.

Robert A. Dahl, Ph D., New Haven, Connecticut, is associate professor of political science at Yale University. He has worked in Washington for the Department of Agriculture and for the War Production Board. He is author of Congress and Foreign Policy (1950), and co-author of Domestic Control of Atomic Energy (1951) and Politics, Economics and Welfare (1953).

Superiority in Nuclear Weapons: Advantages and Limitations

By ARNOLD WOLFERS

AT the time this country alone possessed the atomic bomb, it was widely held that the Soviet leaders were being deterred from going to war by what they estimated to be the wartime advantages which monopoly in nuclear weapons offered the United States. Now, we must assume that such monopoly has ended. At best, we may be able to look forward to a period of uncertain duration in which this country will enjoy superiority in quantity and quality of nuclear weapons as well as in many of the other elements that make up nuclear war power. The question is whether considerable over-all superiority—which will need further definition—can offer sufficient advantages either to act as a deterrent or to contribute materially to the chances of victory. Clearly, in order to estimate these advantages one can no longer confine oneself to the study of what this country could do in war to maximize the military value of its nuclear stockpiles; it is equally necessary to speculate on the use which the “inferior” power can make of its facilities.

IMPORTANCE OF THEORY

It may seem hopeless for one who is not in on the secrets which shroud American nuclear preparedness to try to help improve this country's estimates of its relative advantages. Even the “initiated” are bound to be groping in the dark. Not only is the Soviet Union uniquely qualified for keeping its nuclear policy and power secret, but experience in nuclear warfare is almost entirely lacking. However, if the non-initiated lacks knowledge of facts, with-

out which the relative nuclear war power of the United States and the Soviet Union cannot be compared, he can devote his attention to the development of theory without which the knowledge of facts must remain meaningless.

An example will serve to illustrate the role of theory. If at a given time this country had 1,000 A-bombs while the Soviet Union had 100—two entirely imaginary figures—no valid conclusions regarding American superiority for war could be drawn except on the basis of some theory pertaining to the importance of a 10-1 superiority, with the inferior power possessing 100. In popular suggestions that we must have enough bombs by now to make us capable of a nuclear knockout blow even against an enemy possessing nuclear weapons, theory is implicit; a certain numerical superiority in bombs is deemed sufficient to render a knockout blow possible.

Theoretical reasoning can proceed, fortunately, without having to depend on information held secret. It can operate with hypothetical figures unrelated to existing conditions. Findings attained by means of theoretical war games, as it were, can later be applied and modified by the initiated through changing the assumptions so as to bring them in line with the actual facts or estimates. The following discussion cannot hope to offer more than an illustration of the way in which theory may be put to work.

HITS ON TARGETS

For the purpose of this illustration I shall limit myself to a single set of

greatly simplified assumptions. I shall postulate a situation in which the Soviet Union is capable of placing not fewer than 200 nuclear hits on targets of its choice, including targets throughout the United States, and in which the United States can expect to place at least 1,000, or five times as many, hits on targets of its choice. Obviously, since these figures are arbitrary, no valid conclusions concerning actual American superiority now or in the future can be drawn. For the purpose of simplification no account will be taken of probable differences in the damage inflicted by the respective hits which would result from differences in the potency of the bombs possessed by either side. Many other factors which come into play are either being left out of consideration or are implicit in the stated assumptions.

It is well to realize what forbidding difficulties our initiated planners encounter if they seek to estimate the actual American superiority at a given time in terms of hits on targets. The size of the respective stockpiles is only one of the elements entering into the computation. If a country had a 100-1 superiority in the size of stockpiles but had only enough carriers to deliver fifty times as many bombs to the target, the carriers would be the limiting factor, as well they might become in practice.¹ The same might be true for trained

crews, gasoline supplies, air bases, or any other of the elements that are a *conditio sine qua non* of nuclear striking power. Again, if one of the two countries were better able to intercept the carriers of nuclear weapons and had what is called a higher "killing rate," the other would have to make up for the difference through greater numbers of bombs and carriers in order to attain its assumed ratio of hits.

Hits on targets, moreover, are not of equal value as far as the outcome of a war is concerned. One country might cause ten times more physical destruction to its enemy and yet achieve inferior results, either if the targets it had chosen were less war-essential or if the enemy were less vulnerable to material damage, economically or psychologically.

Also, while superiority in hits on targets is obviously a highly important part of superiority in nuclear war power, it is by no means identical with it. It would help a country little to be capable of making 1,000 hits if with 100 hits the opponent could knock out its ability to continue the fight.

TARGET SELECTION

Superiority in nuclear warfare, then, depends on relative skill in target selection—and on relative target vulnerability—no less than on relative ability to hit chosen targets. Because target selection, the main strategic problem in a war of bombs, is essential to any estimate of the advantages of superiority, the following discussion will concentrate on it.

It was mentioned earlier that in a two-way nuclear war results depend on the nuclear strategy of both sides and thus on the large variety of combinations to which their respective blows and counterblows may lead. Again for the purpose of simplification I shall divide all

¹This holds true particularly if General Hoyt S. Vandenberg is right in his assertion (as reported in the *New York Times* on June 6, 1953) that "it would be a mistake to believe fewer bombers were required to deliver atomic or hydrogen bombs over an enemy target even though their destructive effect was many times greater than that of conventional high-explosive bombers." He explained this statement by saying that while two airplanes with atomic bombs could accomplish what thirty planes would do with conventional bombs, one would have to send thirty bombers along to protect the atomic mission.

targets into a manageable number of categories or target systems and assume that both sides will direct their attack on one system at a time and decide on a specific succession among them. In reality, it would be a question of choosing between the advantages of causing moderate damage to many types of targets and of causing overwhelming damage to a few.

In principle, nuclear bombardment can be directed at the following six main target systems: (1) urban communities; (2) nuclear power in being; (3) nuclear power potential; (4) war-essential nonnuclear industries; (5) tactical targets in the battle zone; (6) targets located in third countries assumed for the purpose of this discussion not to possess nuclear weapons.²

The order in which these systems are listed is not intended to prejudge the order in which the two belligerents, if acting rationally, would place them in terms of priority.

CITIES

When nuclear warfare is discussed, nuclear bombardment of system No. 1, congested cities, looms largest in the public mind. This is obviously due in part to the exceptional horror which such attacks hold in store, and in part to the fact that nuclear weapons were used in this way against Japan and have never yet been used against any other target. For the Soviet Union, assumed here to be the inferior power, there would seem to exist an almost irresistible temptation to direct its attack on our major cities. With a relatively small number of A-bombs it could cause immense loss of life as well as great in-

dustrial destruction. Moreover, if it undertook a nuclear "Pearl Harbor" against our city population, it might hope by terror to crack the morale of the American people at the very outset.

Fortunately for us, this is only half of the story. An attack concentrated on cities leaves the enemy's nuclear power in being almost 100 per cent intact. In the case just mentioned, we would be left as capable of a retaliatory blow as before the attack, unless our government surrendered before our strategic air force had taken off for reprisal in kind—an almost unthinkable contingency. This means, then, that the Soviet Union would have to count not only on suffering the same damage to its cities but on seeing many times as many of its own cities laid in ruin. The whole enterprise thus turns out to be a suicidal venture, unless the death of millions of human beings and the ruin of scores of major urban communities be considered anything but suicidal.

It must be emphasized in this connection that an American attempt to knock out the Soviets first by a blitz against their cities would be no less suicidal from the point of view of this country, given the assumptions of our model and provided we had not first regained a monopoly or near-monopoly of nuclear power. If the Soviet Union preserved the capacity we have postulated, our superiority would not diminish by an iota the damage the inferior striking force could inflict. An exchange of blows against cities would in fact be likely to make third countries the sole winners.

This self-destructive character of blow and counterblow on cities is no guarantee against their occurrence. Even if both countries refrained in the beginning, inadvertent hits on cities, not readily recognizable as such, might easily start a vicious circle. Moreover, one

² If Britain has nuclear weapons, or should come to possess them later, the effects on a war in which the Soviet Union and the United States were engaged would have to be taken into special consideration.

side might think that its people could "take it" while the other side could not, and many other miscalculations might be made even by governments seeking to pursue a highly rational strategy.³

There exists an even greater danger in this respect. One or each of the belligerents may so plan its strategic air forces as to make them capable of little but indiscriminate mass-area bombing, not realizing the suicidal consequences of such a strategy. Instead, one country may become so convinced of its enemy's intentions of using this type of strategy and of seeking to hit first that it will initiate the exchange of blows against cities, possibly by a sneak attack, Pearl Harbor style, if only for fear of striking too late. Actually, it makes no difference whether one is hit by the first blow or by the reprisal blow which immediately follows. Therefore, to hurry for the sake of striking first means taking a useless and tremendous risk.

We talk and do a great deal about nuclear secrecy; but if it were our intention to exercise maximum restraint in regard to bombing of mass areas, it would be essential to give this fact the utmost publicity before our opponent had committed himself to war plans for a crippling blow or counterblow against our cities. In any case, it must be concluded that no belligerent can cease to fear for his cities and city population as long as the enemy's nuclear power in being has not been crippled.

³ It has often been said that the Soviets will show no restraint, because the loss of the lives of their own citizens and of their own cities will make little impression on the men in the Kremlin. I myself wrote in 1946 (see "The Atomic Bomb in Soviet-American Relations" in *The Absolute Weapon*, edited by B. Brodie, p. 135) that we cannot "feel satisfied that the Soviet leaders would under all circumstances shrink from sacrificing their cities if they felt sure of ultimate victory." I now contend, however, that an attack on our cities would mean suicide for them rather than ultimate victory.

NUCLEAR POWER IN BEING

From this it follows that the ideal target for either side, though not necessarily the exclusive one, is target system No. 2, the enemy's nuclear power in being, provided there be any practical chance of reducing it substantially. Here superiority of the right kind can pay its highest—possibly its decisive—dividends. This country would have to commit fatal mistakes if the two hundred atomic hits with which the Soviet Union is being arbitrarily credited here were enough to knock out a major part of our target system No. 2.

It should be remembered, however, that in order to be successful in this respect the Soviets would not have to hit our stockpiles of bombs or even our precious stocks of carriers. The loss of any one element essential to nuclear striking power is enough to eliminate nuclear power in being. For example, either side would cease to have such power while its air bases were out of commission, assuming planes to be necessary for delivery of nuclear bombs. While little can be known today about what it takes to "neutralize" an air base by means of an atomic attack—or even an attack with H-bombs—or about the degree of damage which would have to be repaired after an attack, it stands to reason that the chances of success will rise in proportion to the number of hits, and drop in proportion to the number of bases at the disposal of the other side.

How much the United States could hope to achieve with its superior numbers cannot be guessed without knowledge of many facts; but the difficulty dare not be underestimated of knocking out the nuclear power in being of any opponent credited with a substantial number of bombs, planes, and bases, many of unknown and distant location. While this country with its assumed

great quantitative superiority would surely not wish to miss the unique chance which target system No. 2 offers to regain nuclear monopoly and safety for its cities (even a reduction of enemy nuclear power in being is a distinct gain), the United States could hardly dare to pay exclusive attention to this target; the results might be disappointing.

NUCLEAR POWER POTENTIAL

I have called nuclear war potential the target system No. 3. It includes all industrial plants and facilities by means of which nuclear weapons, carriers, and other elements essential to nuclear power can be produced and reproduced. It need hardly be said that this set of targets is attractive to both sides. Not only is it likely to be highly vulnerable to bombardment, but it is of great use to a belligerent whose initial stocks fail to carry him through the war. The United States would have far more to gain than the Soviet Union from knocking out the nuclear war potential of its opponent, because without it the Soviets would be limited to their far inferior initial stocks. Even if their stock of carriers were plentiful or even superior to that of the United States, it would help them little once they ran out of bombs. In view of the vulnerability of at least a major part of the installations considered here, it should be possible for the superior power to cripple target system No. 3 and reduce the inferior power to its initial stocks.

But if on our assumption the Soviet Union would have to count on losing its capacity for nuclear production almost immediately, the same might be true for the United States as well. It would certainly be unwise to rely heavily on the contributions which nuclear industries and plants producing long-range bombers could make, once two-way nuclear hostilities had started. It is true

that the Soviet Union would have less to gain from eliminating target system No. 3, unless we found ourselves short of long-range carriers, having relied on their replacement, or unless our stockpiles of H-bombs were low at the start; but the inferior power could ill afford to allow its opponent to go on producing nuclear weapons—however time-consuming such production may be—while left to exhaust its own limited stock.

NONNUCLEAR WAR INDUSTRIES

Target system No. 4, comprising the nonnuclear productive facilities which serve the war—including the major part of either country's industries and transport facilities—may need fewer comments because it has become the traditional target of aerial warfare. However, it must be pointed out that the area of destruction being what it is even in the case of A-bombs, not to speak of H-bombs, many of the targets in this category would have to be spared if large cities were not to be destroyed in the process of attack. This constitutes a more serious handicap for the United States, because the Soviet Union, with its inferior stockpiles of nuclear weapons, would have an incentive to proceed along a highly selective pattern anyway.

Both sides would want to concentrate their attacks on installations which would tend to create bottlenecks of serious duration and which lie sufficiently removed from major cities to minimize the risk of unintentional city destruction. Even presupposing a large measure of self-restraint on both sides, this country with its quantitative superiority should be in a position to cut far deeper into the enemy's war-essential industries than he could cut into ours; however, better intelligence or better target detection might tip the balance in favor of the Soviets.

Much would depend, too, on the relative degree to which the two economies

were exposed to bottlenecks. In a protracted war it is at least theoretically possible that this country, with the superiority we have assumed, could bring Soviet war production to a virtual standstill, as Allied forces succeeded in doing in the case of Germany during the last phase of World War II. In a nuclear war this could be achieved without prior attainment of control of the air over Soviet territory.

TACTICAL TARGETS IN THE BATTLE ZONE

In order to do justice to the large number of variables which come into play, a theoretical discussion of target system No. 5, tactical targets within the battle zone, would have to go into more detail than can be covered here. The military tactics used by both armies, the character of the terrain, the offensive or defensive intentions of the belligerents, the nature of their lines of communication, and many other factors affect the number and the vulnerability of targets which might present themselves here to bombs, rockets, and atomic artillery shells. Large numerical superiority would permit the United States to make lavish use of nuclear weapons even on elusive and ever recurring targets of the kind to be found in a battle area and along enemy supply lines. Because precious crews and costly, perhaps non-reproducible, planes can be saved by the use of nuclear weapons, it will always pay to employ them, given sufficient stockpiles, where they can accomplish as much as conventional bombardment.

Despite the fact that the inferior power would be under heavy pressure to economize in the use of nuclear weapons for tactical purposes, it would surely not hesitate to expend them on this target system if this country and its allies were exceptionally vulnerable to attacks against certain points of concentration

in the battle zone. I shall discuss this very kind of vulnerability in connection with the next target system when speaking of the ports on the Atlantic.

TARGETS IN THIRD COUNTRIES

Finally, there remains target system No. 6, targets in third countries, specifically in western Europe. It may be assumed that any country which succeeded in staying out of the war would be spared all but accidental bombardment; all other countries risk becoming victims of nuclear bombardment by either side, whether in the course of battle, of conquest, or of liberation. It is this danger, characteristic of countries lying between belligerents possessing nuclear weapons, that rightly frightens the people of Europe and of some other "in-between" nations. In the early stages of a Soviet-American war the question would be whether targets in western Europe would have high priority on the Soviet list of targets; or, more specifically, whether they would be sufficiently rewarding to divert attacks from targets in the United States. Before discussing the possible fate of Europe's major cities, it may be well to review briefly the other four target systems in regard to that region.

Some of our nuclear power in being, especially in the form of air bases, is almost certain to be located on European soil. The Soviets would have special reason to want to knock out air bases in that area from which nuclear carriers could take off, because they are located relatively close to its borders. Areas on both sides of the Iron Curtain from which rockets with atomic war heads could be launched might also come in for much attention by both sides, although rocket launching sites might prove one of the most elusive targets, even for A-bombs.

Little if any of our nuclear war potential is likely to be on European soil

except perhaps for some of Britain's and continental Europe's aircraft industry. But European nonnuclear productive installations would be particularly likely to attract Soviet attack, assuming the war were being fought in Europe. Their output could reach the battle front with a minimum of logistical difficulty. However, the Soviets might leave them intact with a view to using them after overrunning Europe and thus they might later become an American target.

As far as tactical targets are concerned, they would obviously be in large part in western Europe if a battle line ran through any part of the Continent. Of one such set of targets—the ports of Europe—more will be said in a moment; but first a word should be said about Europe's cities in general.

A nuclear terror blow against Europe's large urban communities, including Paris, Rome, and London, might profit a Soviet war effort immensely, or so at least the Soviet leaders might believe if they expected it to lead to an early surrender of our allies. However, the Soviet Union would be taking excessive risks if its leaders had reason to believe that we would retaliate in this case against their cities as if they had struck at our own. As a matter of fact, it might be hard to convince them prior to the event that such was our intention; particularly difficult if we hesitated to make such a commitment in the case of Europe's port cities, where such intention, as we shall see, could open the door to the vicious circle of blows and counterblows. Europe could have even less hope for its cities if, prior to a war in which Europe were to fight on our side, the Soviets had convinced themselves that we would strike at their cities anyway, irrespective of how much they might be inclined to restrain themselves in this respect.

The port cities are a special problem. They present a tactical target of unique

attraction to the Soviets. Because this country is separated by the ocean from any potential battle front in Europe, and thus from Soviet as well as Allied armies fighting at that front, almost all the vast supplies of arms and men which would be required to feed that front would have to be funneled through American ports of embarkation and European ports of disembarkation. The only exception would consist of supplies flown in by air or landed on scattered beaches.⁴ Here, then, are the "Naples" and "Antwerps" of a Soviet-American war. The temptation for the Soviets to put them out of commission by means of a logistical knockout blow, probably carried out with the aid of ships as well as planes, might prove irresistible whatever the costs. Priority would surely be given to the European ports, both because of their proximity and because of the chance that we might not enter upon a round of blows and counterblows against cities if European rather than American port cities were destroyed in an attack on port facilities.

SOME LIMITATIONS

On the basis of the preceding considerations it is possible now to draw some conclusions concerning the advantages of superiority as they would result from the conditions posited in our model, and assuming rational target selection by both sides. But it must be emphasized again that no conclusions can be drawn pertaining to the position or superiority which the United States actually possesses today or may possess tomorrow. It can only be said that we may enjoy the advantages suggested by the model

⁴ It should be noted that this situation is not arbitrarily created by our commitments under the North Atlantic Treaty. From nowhere could our armed forces reach Soviet soil, as well they might have to if we wished to win, except from territories lying on the other side of the oceans.

to the extent to which the actual relation of nuclear weapons between the two countries happens to approximate the assumptions laid down here.

Limiting ourselves, then, to our single analytical model and the six target systems posited above, it can be said that some advantages for the superior power stand out clearly, while others which might be supposed to exist are, to say the least, doubtful. Thus, to begin with the latter, nuclear superiority of the kind under discussion here does not give assurance of quick or final victory. This is so because of the inescapable hazards of mutually devastating blows at cities which might reduce even the superior power to the rank of a minor belligerent and because the inferior power might cause deficiencies in vital elements of nuclear weapons or insuperable bottlenecks in transportation and war production.

SOME ADVANTAGES

With its assumed superiority, the United States would have a reasonable chance of dissuading the Soviets from undertaking a "Pearl Harbor" on its cities or initiating terror blows in the course of hostilities. In order to do so, the United States would have to keep superior retaliatory power in being and act with a maximum of self-restraint even if its own cities or allied cities were hit inadvertently.

Most important, superiority would offer us an excellent chance of preventing the enemy from crippling our nuclear weapons in being to a point where our country would cease to possess substantial nuclear striking and retaliatory power. We, on the other hand, might be successful in knocking out his nuclear weapons in being, though our superiority would be seriously lessened if the Soviets knew the exact location of our air strips and our carriers while we

did not possess the same knowledge of the location of theirs.

If, despite this handicap, we succeeded in greatly reducing Soviet nuclear weapons in being, our near-monopoly of nuclear striking power thereafter might force quick recognition of defeat by our opponent, if only after a token use of bombs on his cities. In this case—the case of one-way nuclear war—the Hiroshima-Nagasaki type of nuclear strategy would again become militarily and morally justified as the surest means of bringing hostilities to a quick end and saving millions of lives.

It has been said earlier that we could hardly have more hope of retaining our nuclear war potential than could our opponent; but with our assumed far superior initial stocks, at least of bombs, we could better afford to lose the facilities falling under this heading.

In regard to other war-essential industries, the superior power could count on coming out on top unless its economy proved much more susceptible to bottlenecks. The country relatively more dependent on productive facilities located inside of cities would have much to gain from avoiding a mutually destructive round of blows on cities.

In the field of tactical bombardment, quantitative superiority offers immense advantages irrespective of whether the nuclear weapons are delivered by plane, guided missiles, or cannon. However, this advantage would evaporate in the case of the United States if the stream of men and materials necessary to operate overseas air bases and carriers and to feed an overseas battle front were interrupted for any considerable length of time. This leads one back to the American "Achilles' heel," the ports of disembarkation.

DEFENSE PRIORITIES

In our assumptions it was implicit that neither side possessed defensive

means sufficient to prevent the enemy from making the number of hits on targets which we have postulated. If it were possible to develop such defenses for some targets, the priorities accorded to certain targets by the United States might materially affect its advantages. It would appear that top priority should be given to the protection of nuclear power in being and especially to vital and exposed air bases, it being assumed that maximum care would be taken anyhow to protect storage sites of bombs and carriers. Next would come the ports of embarkation and disembarkation, with the former included lest after the latter had been rendered invulnerable the former should be raised to near the top of the Soviet priority list. One way of making these ports less attractive to a would-be attacker would be to stockpile war materials in Europe—a risky procedure if Europe were likely to be overrun—or to provide lavishly for alternative unloading facilities, making minimum demands on ports and harbors.

In this order of defense priorities it would seem as if defense against the most dreaded and deadly attack, attack against urban communities, were being neglected. But these communities are not unprotected as long as we retain sufficient retaliatory power in being to make an attack on them suicidal for the enemy, and as long as we restrain

ourselves from undertaking blows at Soviet cities.

THE QUESTION OF DETERRENCE

It may be asked, finally, whether superiority of the kind assumed here offers the advantage of serving as a deterrent to war or at least as a deterrent to all-out use of nuclear warfare. Superior nuclear power for war could render no better service to this country and to the world. Unfortunately, there is no way of making sure that any amount of superiority will deter an opponent, because deterrence depends on his estimate of this superiority and its consequences, as well as on his willingness to take risks and to suffer losses.

It should only be pointed out that secrecy which hides our strength, whatever other benefits it may bestow, runs directly counter to a policy of deterrence.⁵ Serious attention should be given, therefore, to the development of a rational policy not only of secrecy but also of disclosure and publicity where our strength and our intentions of restraint are involved.⁶

⁵ It would be ironical, after all, if it were ever left to Soviet spies to impress their government with the extent of our nuclear strength and thereby to deter it from acting against us.

⁶ For a discussion of policies of disclosure—limited to the disclosure of new weapons—see Bernard Brodie, "Military Demonstration and Disclosure of New Weapons," *World Politics*, Vol. V, No. 3, April 1953.

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International Control of Nuclear Weapons

By ROBERT W. FRASE

INTERNATIONAL control of atomic energy is as much a psychological and political problem as it is a technical one. There is undoubtedly more than one way in which effective controls could be established, and the choice made will depend upon the dominant currents of thought at the moment.

For the past two or three years interest in the subject has practically died out. This is true not only of official action of governments and in the United Nations, but also of unofficial discussion and writing on the subject. In reviewing the literature recently for an international bibliography on the non-physical-science aspects of atomic energy for the period since July 1950, the author has been impressed with the very small number of articles on international control. The subject of greatest interest by far in this past three-year period, as reflected in both professional and popular writing on atomic energy, has been civil defense, with atomic power in second place. This is a reflection of the mood of the times, not only in the United States but in the rest of the world as well.

If general interest in the subject of international control of atomic energy revives (and the revival of such interest may be a necessary condition of the renewal of major governmental activity), circumstances will undoubtedly be quite different from those in 1945-46; and to be realistic, the types of control schemes explored should reflect these changes. There would not be much point in reviewing the control plans presented to the United Nations in the 1946-48 period, and the negotiations on those plans, with any idea that

if the subject is revived the negotiations will pick up precisely where they left off. It is of interest and value, however, to look at these plans and negotiations to see what the basic technical problems are and how the particular proposals advanced were influenced by the mood and the assumptions of the time. We may then be in a better position to assess the problem of what kind of control plan would meet the political, military, psychological, and technical requirements of the period into which we are now entering.¹

THE ACHESON-LILIENTHAL PLAN

It was in 1945 and early 1946 that the United States Government took the initiative in proposing the international control of atomic energy. The impetus for this move, and its acceptance and support by the public, came from the shock of the mass destruction made possible by this new weapon; the horrors of Hiroshima and Nagasaki; the desire to be done with war after the recent experience with a major conflict; and the fear of a future war with a potential enemy coalition headed by the Soviet Union, combined with the hope that this potential enemy might be induced to reform its totalitarian and expansionist ways.

The actual proposal developed and put forth by the United States—the

¹ For a detailed and documented review of the evolution of United States policy on the international control of atomic energy and negotiations in the United Nations Atomic Energy Commission through the year 1949, see the series of three articles and technical appendix in the *New Republic* for April 3, 10, and 17, 1950, prepared by Robert W. Frase and James R. Newman.

Acheson-Lilienthal plan modified in one major particular by Baruch—also reflected this psychological mood. The central and unique feature of this control plan, as compared with earlier plans to control and reduce armaments, was the establishment of an international co-operative enterprise for the development and then the production of electric power, using fissionable materials as fuel. There had already been enough experience with Soviet secretiveness to persuade the drafters of the Acheson-Lilienthal plan that any system of control based solely on limitation and enforced by inspection would be unacceptable to the Soviet Union in the first place, and would break down in practice if initially accepted. It was thought that some positive inducement other than the obvious mutual advantages of controlling this destructive new force had to be held out.

The additional positive benefit offered to the Union of Soviet Socialist Republics was, of course, the prospect of a new source of electric power, to be made available at a much earlier time than the U.S.S.R. could do it alone through the contribution of United States and British know-how (or "secrets").

The substitute for the inspection system was the development and actual production of atomic power by a new international agency in whatever country the plants were located. There would thus be no need for much inspection of the production plants themselves, because the international agency would itself be conducting the atomic enterprises in the U.S.S.R. as well as in other countries. Inspection would be confined to ensuring that no secret or illegal production plants were built or operated.

FOUR FACTORS IN FAILURE

There was much to commend this approach in the circumstances of the time.

It failed, however, to secure Soviet acceptance over the two years from June 1946 to September 1948, when there was more or less active negotiation in the United Nations Atomic Energy Commission. In retrospect, and on examination of the record, the failure appears to have stemmed from four main factors. There may have been others (including the personality of Stalin), but only someone privy to the secrets of the Kremlin would be able to speak with any authority on that point. The four factors, not necessarily in order of importance, were the Soviet fear of contact with the West, the Soviets' suspicion of joint enterprises in which they considered themselves to be in a minority position, the lack of any immediate and tangible prospects of economic benefits from atomic power, and the hedges which were placed around the offer of a joint international enterprise to develop and exploit atomic energy for peaceful purposes. Each of these deserves some further discussion.

Fear of contact with the West

To some who participated in the United Nations atomic energy negotiations, the major reason for the Soviet rejection of the United States proposals was thought to be the breaching of the Iron Curtain. The control system would have introduced internationally recruited inspectors and other employees into the Soviet Union on a long-term basis. The Soviet rulers were thought to be resisting any such development on two counts: for political reasons because it might lead to unrest and subversion of the Soviet population, and for military reasons because it would reveal Soviet military secrets in fields other than atomic energy.

There can be no doubt that Stalin would not have welcomed this breach in the Iron Curtain, but there is perhaps

some question as to whether this was an absolute barrier to Soviet acceptance of an international control plan. Might it have been overcome if the advantages had seemed great enough? One fact bearing on the question was the acceptance by the Soviets—after a great show of resistance—of the two internationally staffed missions of the United Nations Relief and Rehabilitation Administration which were in the Ukraine and Byelorussia for over a year in 1946–47. When it became clear in late 1945 that if there were no missions there would be no UNRRA relief programs, the Soviet Government agreed to the missions.

Suspicion of joint enterprises

In the original form of the Acheson-Lilienthal report, the Russians would have had to overcome their fear of being outvoted in an international atomic enterprise, and this would not have been easy for them to do; but they might have had a somewhat easier time of it without the modification of the plan developed by Baruch and presented as the official United States proposal in June 1946.

The Acheson-Lilienthal report imposed no new machinery of sanctions for violations of the proposed atomic energy control treaty. The plan was designed to provide what W. T. R. Fox later called "a reliable fire-alarm system"—a system which would provide timely and reasonably certain notice that fissionable materials were being secretly and illegally accumulated for the purpose of making bombs. The theory was that if such violations occurred, other nations would take such action, including collective action, as the circumstances warranted—even to war or the threat of war.

To this concept Baruch would not agree, and he won the support of Secre-

tary Byrnes and President Truman over the opposition of some of the authors of the Acheson-Lilienthal report. Baruch added to the scheme a proposal to remove the veto in the Security Council with respect to collective action following violations of the atomic energy treaty. The Security Council, under this proposal, could by majority vote invoke sanctions for atomic treaty violations, including collective military action.

This aspect of the Baruch plan was the principal ostensible cause of the Soviet objection to the United States plan in 1946. Subsequently, the Baruch proposal on the veto was more or less disowned in a quiet fashion by the United States negotiators who followed Baruch; but the question of the veto at the very least provided an issue, as Chester Barnard predicted in advance that it would, on which the Russians could "dance up and down indefinitely."

Lack of immediate prospects for atomic power

There was a good deal of optimism in early 1946 about the prospects for developing economic electric power from atomic energy, and this was also thought to be a major inducement to the Russians to enter into a co-operative international atomic energy enterprise. Less than two years later this prospect for economic atomic power had receded into the more distant future—so much so in fact that the "Majority Plan" for atomic control finally voted by the United Nations Atomic Energy Commission in September 1947 was based on the explicit assumption that the international atomic authority would not be in the power business for some years. A little-noticed provision of the plan required an amendment of the basic control treaty after a showing of the technical and economic feasibility of beneficial uses, before any

large-scale accumulation of plutonium would be permitted.

This amounted to a finding—now confirmed by experience—that economic atomic power was some years away and that the international atomic development authority would not be heavily engaged in this area until the basic atomic control treaty had been amended. The Russians were apparently equally aware of the long-term problems involved in developing electric power from atomic energy on an economic basis, despite their propaganda bombast at times which charged the United States “monopolists” with trying to curtail peaceful atomic development in order to preserve their present investments in electric power production based on conventional fuels. As Professor Skobeltsyn, technical adviser to the Soviet delegation, stated in the summer of 1947 (in the indirect quotation used in a United Nations document):

If the opinions of experts on the subject were to be accepted, it might be decades before atomic energy could be utilized in industry; and this would result in the simplification of the whole problem of the structure of the system of control. He [Skobeltsyn] felt that some of the members were incorrectly basing their discussion on the belief that the application of atomic energy could be realized in the near future.

Even today, six years later, the era of large-scale economic atomic power is still being placed a decade or two in the future. In the recent hearings of the Congressional Joint Committee on Atomic Energy, United States private enterprises seem not yet to have come forth with a firm offer to enter this field with their own capital without government support, such as the sale of by-product plutonium for bombs to the United States Government. Thus a key element in the original Acheson-Lilien-

thal plan which was designed to attract the Russians with economic advantages, soon turned out to be an overoptimistic assumption in the short run, and was actually formally so designated in a key provision of the United Nations Majority Plan of September 1947.

Hedges in United States proposal

The principal hedge in the United States proposal of 1946 actually antedates the Acheson-Lilienthal report itself. This was the matter of “stages,” which was included in the Truman-Attlee-King declaration of November 1945, and subsequently elaborated in the final section of the Acheson-Lilienthal report. In brief, the idea suggested in these documents was that the international atomic control and development agency would take over atomic operations in stages, starting with a survey of raw material resources and progressing up the production chain to the plants which produce fissionable materials.

To this the Russians made violent objection, and proposed as early as February 1946 that the international control agency take over operations of all kinds at one time. The actual sequence or timing of stages was never discussed in detail at the United Nations Atomic Energy Commission at any time, nor was it incorporated in the Majority Plan of 1947.

The objection of the Soviets to starting with a wide-ranging survey of raw materials was that it would reveal to the West many nonatomic military secrets—such as the location of industry and airfields—prior to their getting any “secrets” from the United States, for example the methods of operation and the capacity of the large United States production plants like Oak Ridge and Hanford.

The reasoning behind the United States proposal on stages was to pre-

serve our principal atomic secrets until a test of Soviet good faith had been made in the survey of raw material resources and other early stages in the plan.

This, then, was the United States proposal, its evolution in the United Nations in 1946-47, and the reasoning behind it. The Soviet counterproposals are not worth discussion in any brief analysis such as this; they were inadequate, rigid, and unimaginative. Only in its comments on and suggested amendments to the United States plan did the Soviet delegation occasionally reveal its understanding of the nature of the problems involved.

ATOMIC AND OTHER ARMAMENTS LINKED

Since 1947 little has been done in the United Nations in elaborating a concrete plan for atomic energy control. At the Assembly Session in 1950, the United States proposed the merging of the United Nations Atomic Energy Commission and the United Nations Commission on Conventional Armaments. The latter had accomplished even less than the former. In the 1951 Assembly Session this proposal was approved, and early in 1952 the two previous Commissions were dissolved and were replaced by a new Disarmament Commission. United States working papers on disclosure and verification of armaments and armed forces and on essential principles of disarmament were submitted to the new Commission early in 1952; these were followed by a British-French-United States working paper on setting numerical limits on armed forces.² On April 8, 1953, the Assembly adopted a resolution requesting the Disarmament Commission to continue

its work and to report to the Security Council and the Assembly not later than September 1, 1953.³

The United States move to combine the consideration of limiting conventional armaments and the control of atomic energy was officially stated to be a reversal of the previous United States position. It made much sense both in terms of the United States interest and in terms of the technical problems of developing a workable and acceptable control scheme for atomic energy.

The initial move of the United States in 1946 to secure atomic control first, when we had atomic bombs but had demobilized our vast war machine while the Russians had a large army but no atomic bombs, would actually have weakened the United States and strengthened the U.S.S.R. in the world military power balance. Baruch was conscious of the problem, as indicated in a letter he wrote to Representative Vorys of Ohio early in 1947 in response to an inquiry from Vorys as to whether we had not better try to secure control and limitation of the Red army along with atomic energy control.

In addition to these considerations of immediate self-interest, it seemed possible that combining conventional armaments control with atomic energy control might help to secure agreement and to make possible a more certain method of control. It might help to secure agreement because any system of inspection which would be sufficient to enforce a limitation of armed forces and conventional armaments would have to be so detailed as to be capable of serving the needs of atomic control as well. It might strengthen the control of atomic energy because if, for example, bombers capable of carrying atomic bombs were to be prohibited, this would provide an additional protection against surprise

² *First Report of the Disarmament Commission*, United Nations document DC/11, May 29, 1952, 6 pp. mimeo.

³ United Nations document A/L. 149, April 8, 1953.

atomic attacks; both the bombers and the atomic bombs would have to be secretly manufactured by an aggressor in violation of the control treaty and without detection by the inspection system.

So much for what is past. What are the elements in the present situation which would shape a new beginning on the atomic control problem?

LACK OF QUANTITATIVE INFORMATION

The most important question, of course, is whether there is any point in considering a new beginning. J. Robert Oppenheimer, the physicist and probably the chief shaper of the Acheson-Lilienthal report, has recently suggested that not much can be done about controlling the destructive aspects of atomic energy unless some additional facts are made available for public discussion.⁴

The most important of these facts is approximate quantitative information on the destructive potential that the United States and the U.S.S.R. have piled up in atomic bombs. Oppenheimer's opinion is entitled to great respect because of his knowledge of the technical aspects of the problem obtained behind the curtain of secrecy, plus his experience in the drafting of the Acheson-Lilienthal report and later participation in the panel of consultants to the State Department on the problems of disarmament in 1952. This group, consisting of Vannevar Bush, John Richey, Allen W. Dulles, Joseph E. Johnson, and Oppenheimer, was appointed in the spring of 1952 and apparently spent a good deal of time later that year in reassessing the problem of disarmament and atomic control; but neither their report nor any suggestion of what is in it has been made public.⁵

There is much to be said for Oppenheimer's view that it is difficult to con-

duct any intelligent public discussion unless at least the rough outlines of the quantitative situation are available. Oppenheimer himself, however, has not attempted to supply any such outline (although he suggests that it can be estimated by any competent military intelligence organization), except for his personal impression that the Russians are about four years behind the United States in atomic development. This would place them in mid-1949. At that time various public data suggested that the United States might have some 200 bombs of at least the caliber of the Hiroshima or Nagasaki type; so the U.S.S.R. may have about that number now. Since then, United States production of fissionable material has undoubtedly been stepped up, and the efficiency of the use of uranium 235 and plutonium increased.

ROUGH ESTIMATES

As a rough estimate, we may have doubled our scale of production since 1949 and thus may now have the equivalent of at least 600 bombs of the early type. The number of bombs the United States has been willing to expend in tests (41) also suggests that our stockpile is quite substantial. Precise figures are, to a considerable extent, not so important as Oppenheimer's expert opinion that the Russians are about four years behind us. If the figures of 200 and 600 are too high now, they will not be two or three years hence; fissionable material does not deteriorate, and can be progressively accumulated without loss for an indefinite period. The development of the H-bomb does not change the essential nature of the problem, since the newer weapon requires an A-bomb as a detonator.

With respect to the equally important question of the means of delivering atomic bombs, the Russians probably

⁴ *Foreign Affairs*, July 1953.

⁵ *Department of State Bulletin*, p. 792, May 19, 1952.

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have a sufficient fleet of several hundred B-29-type planes which are capable of reaching the United States, particularly in one-way suicide missions. Our own air defense system has not been officially claimed to amount to much now, especially with respect to the warning system. Thus the United States is undoubtedly already vulnerable to atomic attack on a substantial scale, and various government studies hinted at in the press indicate a growing official concern about the need to provide a greater measure of protection than we now have.

On the offensive side also, the odds have probably evened somewhat between us and the Russians in the air-atomic field. The acquisition by the Russians of good jet fighters makes our B-36's vulnerable except in night and bad weather attacks. We have, in fact, apparently abandoned further production of these rather slow piston engine planes and shifted the bulk of heavy bomber production to jets. The jets, however, have a much shorter range, and depend much more heavily on air bases in Great Britain, Europe, North Africa, the Middle East, Japan, and Okinawa.

THE RISK OF CONFLICT

Thus, although we could now injure the Russians much more than they could punish us in an air-atomic duel, we are vulnerable and will probably become more so. The atomic weapon is no longer a deterrent to war in the way that it used to be—a force which could strike the Russians without their being able to strike back directly at the United States. It is still a deterrent, of course, in the sense that we are in the position of a man with a carbine facing one who now has a pistol, whereas formerly he had only a club. The man with the pistol is not likely to start shooting if he is guided by purely rational considerations.

Actually, of course, this analogy will not hold in the area of international affairs. Even the action of individuals is frequently influenced by nonrational considerations. International politics is far more complicated than, and probably not so rational as, dealings between individuals. An accident, a miscalculation, the pressures of internal politics, the action of an ally, the irrationality of a key individual—any one of these could start a conflict which would lead to the use of atomic bombs and the destruction of a large part of the urban civilization of the U.S.S.R., western Europe, and the U.S.A. Five or ten years from now such a conflict might destroy almost all of the urban industrial area in all three regions.

The crisis, in a sense, is no nearer in any tangible way than it was five years or eight years ago. No one can say that 1955 or 1957 or 1960 will be the crisis year. But the destructive potential continues to build up at an increasing rate, and one spark, one lapse of rationality, might set it off.

There remains, therefore, the same rational incentive that has existed from the beginning to keep trying to achieve international control of atomic energy, to keep sounding out the Russians through diplomatic channels every now and then to determine whether their position has changed. In the flux and upheaval resulting from Stalin's death it is conceivable that their policy in this field may be subject to reconsideration, just as other policies appear to have been reviewed.

FEATURES OF CONTROL PLAN

It may, however, take more than a mere general sounding out of the Russians to get serious negotiations started again. We may require a concrete plan—at least in its main outlines. What kind of proposal is most likely to meet

all the requirements of the present situation?

It is here that the lack of information particularly handicaps intelligent thinking and public discussion, to such an extent that the functioning of the democratic process almost ceases to operate in this area. It is possible, however, to consider two of the major features of any armaments control plan and to reach some tentative conclusions as to what is required with respect to each of them in the present situation. These are the questions of what is to be limited and controlled, and whether the limitations on major weapons are to be partial or an outright prohibition.

As already noted, the United States position most recently has been to insist on the control of all major armaments, including atomic weapons, and the components of armed forces. This is a reversal of an earlier position of insisting on control of atomic energy first. The control of conventional armaments along with atomic energy still appears to be a wise policy, although it is not so obviously important in the United States interest as it was a few years ago, when we had a monopoly or near-monopoly of atomic bombs, and a limitation of atomic energy alone would have weakened our power position vis-à-vis the Red army. But even now, if only atomic energy were controlled, a race in other armaments might contribute to the danger of war; and under the pressures of a long major conflict the atomic control scheme would no doubt break down.

LIMITATION OR PROHIBITION?

The second major question—should there be limitation or prohibition—is particularly important with respect to the control of atomic energy. The original United States proposal, as we have seen, was to outlaw only the use of atomic bombs, but to permit and even

to encourage the production of electric power from fissionable material. Outright prohibition of the production of fissionable material would have provided greater safeguards, a longer period of warning if the control scheme broke down, and a simpler control plan. Prohibition of production was rejected because we did not ourselves wish to forgo the potential economic benefits of atomic power, and we felt that a joint international atomic enterprise would be both more attractive to the Russians and more durable as an inspection and control device. Subsequently, in 1947, in the United Nations Majority Plan, we took a middle position which probably had most of the defects of both extremes. We continued to insist on the international development authority, but we put off to some indefinite time in the future the functioning of such authority on a significant economic scale.

We still have a hard choice to make on this question, and the facts on which to make the choice seem as inconclusive and baffling as they have always been. Electric power has now been produced from atomic reactors, both by ourselves and by the British. A test of how cheaply such power can be produced from a reactor which is designed *only* for power still seems five or more years away. Thus if we continue to propose an international atomic development authority, we shall still be proposing, as we were in 1947, an agency which would be engaged primarily in research and development for the next few years. Such a proposition might be even less attractive in an economic sense to the Russians than it was six years ago. The U.S.S.R. has been working on atomic energy during all of the intervening years, and may be almost as far along as we are with respect to the development of reactors for power. Pooling of knowledge might not advance their progress by much.

ATOMIC POWER BALANCE

The problem of the atomic power balance under a plan calling for large-scale production of electric power from fissionable material also seems no easier of solution now than it has ever been. This problem remains precisely where it was when discussed in the Acheson-Lilienthal report; it was never subject to negotiation in the United Nations Atomic Energy Commission. The Acheson-Lilienthal report proposed simply that the atomic power plants (which would also produce or be capable of producing large amounts of fissionable material usable in bombs if electric power were produced on any large scale) be distributed around the world in a "strategic balance"—a kind of atomic balance-of-power arrangement. If the Soviet Union or some other aggressor were to denounce or violate the atomic control treaty, the remaining nations of the world would have sufficient fissionable production capacity in their power plants to exceed the aggressor's bomb-making capacity. But the problem of allocating this power-and-bomb capacity was so formidable that it was never tackled. It remains just as formidable today.

In the present-day world it hardly seems conceivable that the Soviet sphere would accept less than half of the world's total atomic power and bomb production capacity, or that the rest of the world would grant the Soviet bloc that much.

Perhaps there have been technical developments behind the curtain of atomic secrecy which would make atomic power plants less dangerous in the political sense—plants which would "burn" natural uranium but would not be efficient producers of plutonium if seized by an aggressor. This seems unlikely, however. If such a development had occurred it could reasonably be expected

to have resulted in a new initiative for atomic control based on this simplifying factor. The recent public technical discussions of reactor development rather suggest the contrary; the emphasis is tending more and more towards the "breeder-power" reactor, which would produce electric power from the heat of the process and also produce more plutonium or U-235 than was consumed. This is the promising economic development, the only real hope of large-scale production of power from fissionable material, because it would permit the utilization of far more than the one part in 140 in natural uranium which is fissionable.

THE ALTERNATIVE PROPOSAL

Here again we seem to be back where we were in 1947 in the Majority Plan. There is now, as there was then and even earlier, the alternative of frankly proposing an interim control plan for a period of years, based on an absolute prohibition of the manufacture of fissionable material, as well as of the production of bombs, and the enforcement of this limitation by inspection. Inspection there has to be in any event, even with an international atomic development authority, to assure that secret and illegal production does not occur.

This alternative has been proposed by various students of the control problem through the years from 1945 to the present day, but it has never been officially discussed in the international negotiations. The nearest approach to such discussion was when the Majority Plan of 1947 accepted the premise of this scheme, an interim period of no significant production of fissionable materials pending the demonstration of the economic utility of atomic power, but continued to insist on international ownership and management of all atomic activity by the international authority.

The alternative proposal offers a solu-

tion—if only a temporary one while atomic power is not an economic reality—to the problem of the geographic allocation of atomic production capacity that seems so insoluble politically in the present-day world. Perhaps this is the time to bring it forth for discussion with the Russians. If the new Soviet rulers are not disposed to make another try at atomic energy control, they would probably greet this proposal with a propaganda campaign about United States monopolists' trying to stifle technical and economic progress. If they are ready to try again, they might find this an acceptable alternative which would meet many of their announced objections to the United Nations Majority Plan. From the point of view of workability and safety for the West, it should be at least as acceptable to us as our earlier proposal.

NEW DIFFICULTIES

It should be pointed out that whatever control plan is now proposed will present a good many more difficulties than any plan discussed in 1946, when only in the United States was there production of fissionable material and that was on a relatively small scale.

We now have a great accumulation of U-235 and plutonium, and a large investment in production plants. The Russians have a smaller stockpile and fewer plants, and the British still less. What is to be done under an international control scheme with these stockpiles of fissionables, and with the plants at Hanford, Oak Ridge, Savannah River, and Paducah in the United States and similar British and Soviet installations? The absolute monetary value of both stockpiles and plants is small in terms of their usefulness with respect to any future development of atomic power on a self-sustaining economic basis, but the popular psychological value placed on them is likely to be very great.

The other new and difficult question is how we can be certain, now that production has so increased, that all the fissionable materials produced prior to the time of the signing of a control treaty could be properly accounted for. How could we be sure that a secret stockpile sufficient for a considerable number of bombs had not been held out? Some writers have suggested that this may be the "point of no return"; that a control treaty may not be feasible for this reason alone, once production and stockpiles have grown to a certain point.

CONCLUSION

The world seems to have become numb, even paralyzed, with respect to doing any thinking or taking any action about warding off an atomic catastrophe. Even defensive measures, which at best may be palliatives, are not vigorously pursued. Secrecy seems to have become a comfortable and habit-forming sedative.

No one can forecast the course of events, especially in a unique situation. Perhaps the two atomic "scorpions in a bottle," to use Oppenheimer's term, will remain torpid indefinitely while the poison in their tails increases year by year. For some time after the First World War there was a popular theory that the destructive power of modern weapons had made large-scale war obsolete on rational and practical grounds. The price of victory would far outweigh its benefits. Then came Hitler.

The seekers of great power are not noted for their rationality. Nor is the vast destructive potential in the present and prospective atomic stockpiles any more of an assured war preventative than was the lesser power of conventional weapons prior to World War II. Some major elements of the old plan of atomic energy control now appear to be obsolete. There can be no guarantee of

success in any new attempt at international control—the odds are poor as they have always been; but the responsible statesmen of the West would seem to have an obligation to keep sounding out the Russians from time to time with a new and modernized proposal.

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The Economic Consequences of Atomic Attack

By DAVID F. CAVERS

IN a nation which is spending billions to equip its military arm to wage war against a dangerous enemy, yet begrudges millions to protect its own citizenry against that enemy's attack, other paradoxes in thinking about the problems of defense are, I suppose, to be expected. Yet I continue to wonder at the persistent tendency to treat civil defense against atomic attack as a problem of protecting simply against *physical* damage and injury. The economic consequences of atomic attack and the measures, legal and economic, required to reduce its impact have received startlingly little attention.¹

This is all the more surprising in view of the intricacy of the economic, social, and political relationships which make the United States a national community instead of merely a collection of people and buildings set in space. Much study and organizational work are being devoted to the design of warning systems, shelter arrangements, fire-fighting operations, medical treatment of casualties, and, to less extent, the feeding and housing of refugees. Some planning has gone to the maintenance of order and certain basic governmental services in

stricken areas, and a few voices are still raised in advocacy of dispersal policies.

Preoccupied with physical damage, these studies have given little attention to the economic activities pursued in stricken areas, and the effects of their disruption (as well as of threats of further attack) on the rest of the country, most of which will remain *physically* intact, even under protracted atomic bombardment. Attention is paid, to be sure, to industrial production, especially of war plants, but this is considered primarily in terms of the physical activities being carried on, not the economic organization of which they form an integral part.

BUSINESS CENTERS AS CRITICAL TARGETS

One of the explanations for this monumental oversight may be the often encountered assumption that the prime enemy targets would be steel mills, atomic reactors, airplane factories, and other key industrial plants. Of course these would be targets of any enemy possessed of enough H-bombs and A-bombs to spend them freely and to sustain heavy delivery losses. But if thrift in using bombs were important to the enemy, and particularly if it sought the advantages of initiating war by a paralyzing surprise attack, then the great financial and commercial centers on the seacoasts or within guided-missile range of the ocean would seem by far the most attractive targets, especially if our current state of utter unpreparedness should continue.²

¹ Peculiarly to blame for the present imbalance, in my judgment, are the members of my own profession, the lawyers. They are the experts in contingency on whom governments, business firms, and individuals alike have traditionally relied to devise workable arrangements to prevent, mitigate, or liquidate the consequences of disappointed expectation, accident, and even disaster. Some planning for clients has, of course, taken place, but legislative and institutional arrangements have not even reached the discussion stage. An article by a leading Los Angeles attorney, Homer D. Crotty, "The Administration of Justice and the A-Bomb," *American Bar Association Journal*, Vol. 37, No. 12 (Dec. 1951), pp 893-96, is an isolated exception.

² I need scarcely add that that fat sitting duck, Washington, though rather less accessible, would repay a considerable expenditure of guided atomic missiles or other vehicles of atomic attack. Unless and until assured to the

These centers are the ganglia of a vast network of business relationships through which the United States carries on its economic life. With the impact of a blow on the solar plexus, the atomic destruction of these centers, especially by a surprise daytime attack, would set off a series of shock waves that, unless cushioned by advance preparation, would disrupt the functioning of American business and impose terrific strains on the nation's capacity to mobilize for war.

TYPES OF PROTECTIVE MEASURES

Fortunately, this is a problem that, however complex, can be tackled. The job calls for the investment of a great deal of hard thinking and planning but a relatively small amount of money. We must design and adopt a secondary network of stand-by relationships which can go into effect immediately after attack. Even if such a network were in existence, great and widespread harm would be sustained; but the relevant comparison is between panic and its attendant chaos, on the one hand, and the orderly treatment of grave economic injury, on the other.

The measures needed fall into three categories: (1) legislation, state and federal, in a number of fields, substituting new procedures, rules, and principles to govern private relationships during the period of disruption; (2) private arrangements in contracts, leases, mortgages, wills, trusts, and so forth, to meet contingencies arising out of atomic attack, many of which could be effected under existing law, while others would have to await authorization under the new statutes; (3) a basic plan concerning compensation for the injury and death of persons and the damage and destruction of property by atomic at-

contrary, I think we should consider Washington prostrate within the first hour of warfare.

tacks. Whether or not the compensation plan uses the war risk insurance principle, whether or not it purports to be comprehensive in its coverage, little other legislation and private arrangements can be wisely planned unless the extent to which the federal government is prepared to underwrite losses can be gauged.

Before I attempt to discuss these measures further, let me be more explicit concerning the nature of the hazards that are involved in the exposure of our great commercial and financial centers to attack.³ The dominant fact, I think, is the vital role played by credit in the operation of the vast and intricate set of contractual and proprietary relationships that constitutes our economic system.

STRAIN ON THE CREDIT SYSTEM

The strain that successful though limited attack would impose on the credit system would be terrific. The alternative to an epidemic of runs on banks would be a grim bank holiday, covering the stricken cities initially, and perhaps rapidly expanding. Despite the aid that the Federal Reserve System and the Federal Deposit Insurance Corporation could extend, if not themselves prostrated by losses in executive manpower, staff, and facilities, a tremendous financial operation would be required to evacuate deposits from New York City alone—and remember that banks and business firms all over the country keep

³ Incidentally, the effect of successful attacks on only a few such centers—for example, New York, Houston, and San Francisco—upon the functioning of similarly exposed centers such as Boston, Philadelphia, New Orleans, and Los Angeles might be almost as disruptive as actual attacks on the latter centers. Will an automobile-owning American citizenry helplessly await extinction in an obvious target area? And for how long? And how, without careful advance preparation, will the businesses operating in those areas transport their activities elsewhere?

large sums on deposit with New York banks. Of course, New York as a financial center is no stronger than its window glass. Once attacked, it would be out for the duration.

But, like the stock exchanges which would promptly be closed where they were not obliterated, banks represent only a conspicuous starting point. The immediate losses (physical and economic) sustained in the stricken areas alone would render insolvent a great many firms with all or major parts of their businesses in those areas. Few would escape even if a comprehensive scheme of war risk insurance or compensation existed and became immediately operative (the latter a highly dubious condition, being economically dangerous and administratively impracticable). Solvency ordinarily depends on the maintenance of a going concern, not on the existence of claims for compensation.

A secondary wave of insolvencies would soon follow. The areas which we have assumed would first be stricken are great consuming, manufacturing, and distributing centers. An upstate dress factory or a New England gadget maker would have a good set of accounts receivable one day and a long array of bad debts the next. Worse still, he would have lost half his customers and would wonder—with reason—about outstanding contracts and new orders from the other half, most of them in target areas. Would he meet his payroll? Would he meet his bank loan?

A factor to be reckoned with in assessing credit problems is the power often reserved by creditors in extending business loans to accelerate the maturity of term obligations if conditions arise which render the creditor insecure. These provisions would, if unchecked, operate to render immediately payable a great volume of debt that would otherwise fall due over a considerable

period of time. They might trigger a credit collapse.

The reader need scarcely be reminded of the billions in consumer credit outstanding and the dependence of great industries on its continued flow. Added to consumer credit losses in the stricken areas would be the rapid expansion of such credit losses elsewhere as payrolls felt the force of the secondary wave of insolvencies and as a general spirit of uncertainty gripped city after city. (Just how many refrigerators would a finance company repossess? My guess is that, in exposed areas, cars could be repossessed only at gun point.)

CONTRACT PROBLEMS

In addition to credit problems of the ordinary sort (of which I have noted only a part), we should have a wide range of problems based on the effects of attack on long-term contracts. Let me instance only a few categories: (1) supply and requirements contracts, frequently entered into by manufacturing firms for periods of years, the price and volume terms of which presuppose a reasonable continuation of the status quo; (2) long-term leases, many of which, though on unscathed buildings, would become economically oppressive; for instance, a lease on store property in a Westchester suburb after Manhattan had been bombed during business hours; (3) long-term employment contracts; for example, contracts of high-salaried executives and research men with firms which would still be in business but would suddenly have little need for their services; (4) pension plans, hard hit in their portfolios and meeting simultaneous waves of retirements and of reductions in employer contributions.

None of these, it should be noted, is a problem confined to bombed-out areas.

Where ordinary business practice is to deal on a short-term contractual basis (which means that one party is in



effect giving credit to the other and is carrying it by his working capital or bank loans), new sets of uncertainties would arise. How far would the reasonably safe firm in, say, Scranton or Elkhart or Nashua go in selling to old customers in still unhit target areas like Baltimore, Philadelphia, Pittsburgh, Detroit, Cleveland, Boston, or Providence? What should its new contract terms be? Multiply this example by one hundred thousand or so.

LIMITATIONS OF GOVERNMENT ACTION

As these economic dislocations were occurring (during a period of horrible human suffering and countless personal tragedies), should we assume that this process of economic "transition" would be smoothed over by government action and that the dislocated persons (like automobile salesmen in World War II) would find themselves absorbed in war production or in public administration? The answer, I think, is clear. In the absence of careful advance preparation, this could come about only gradually and after we had muddled through the economic disruption I am forecasting.

We have seen the slowness with which our unimpaired government machinery shifted gears in 1950 when the Korean invasion and the Chinese attack made rearmament essential. Yet that task seems simplicity itself when contrasted with the countless adjustments to be worked out by the survivors of a government that had been blown out of its capital city and was trying at once to wage war and meet the minimum survival needs of millions of refugees. Moreover, if atomic attacks were also being sustained by the industrial establishment, it might well be shrinking rather than expanding.

In appraising the functioning of the federal government, consider only one operation that atomic attack would entail: price control. Most of the prob-

lems faced by the Office of Price Administration in World War II were solvable because of the underlying stability of the wartime economy. The slack in the demand for certain products was taken up by others. Savings were huge. The pattern of demand was relatively normal. However, as the war continued, conditions began to change, and OPA was, as I know from personal observation, hard pressed to adapt its policies to the new situations. Yet I encounter many people with price control experience who still think of fighting the economic battles of an atomic war with the weapons forged in World War II and recently refurbished for the Korean crisis. This is folly. A wholly new planning job is needed, integrated with planning for other economic controls on a much broader front, and taking account of the fantastic departures in both directions from normal demands for goods and of new tendencies both to hoard and to squander.

MANAGERIAL PROBLEMS

The limitations of improvised governmental action to cope with the crisis would be matched by the managerial problems of private business. A surprise attack on New York alone, if in business hours, could decapitate a wide segment of American business. Closely held corporations might lose not merely their officers and directors but also their shareholders. Plants in the country would survive when top management was lost. Even if a protracted crisis preceding attack had led many firms to put into effect existing plans to keep skeleton forces of officials and trained staff out of the target area, the burdens thrust on them would be far heavier than the full complement had been used to carrying.

The existence of records on microfilm might help, but the difficulties of its use (what would be the supply of "read-

ers"?) and the sudden irrelevance of many of the recorded data would mean a drastic slowdown in operations dependent on them.⁴

LÉGAL AND JUDICIAL BOTTLENECKS

The legal profession would form another bottleneck if a surprise daylight attack succeeded. The attorneys are the very people to whom the stricken banks and business corporations would ordinarily turn to meet problems of the sort that would multiply immediately in the wake of an attack. But the attorneys and their offices are just as vulnerably located as the banks and corporate offices. Those who survived would face, perhaps twenty times the normal demand for their services. Yet they would be handicapped by loss of offices and files and by the general disorganization of the community⁵ and particularly of its courts.

In normal times, the court system is directly involved in only a small fraction of the community's affairs. Only a small part of the nation's firms go bankrupt, even in a depression year; only a tiny fraction of all contracts give rise to disputes involving litigation; only a relatively few propertied people die each year. Atomic attack would alter this situation drastically. As insolvencies multiplied, demands for bankruptcy and arrangements would expand explosively. Contract disputes would also proliferate as the basic presuppositions of the contracting parties were destroyed.

The pressures on the courts handling

⁴ An official of a large insurance corporation told me a year or so ago of a machine that his company had acquired to print microfilm records on cards at an almost miraculous speed. He remarked that there were then *two* other such machines in existence.

⁵ Manhattan business offices would doubtless be unusable after an attack, especially during the cold seasons. If the enemy were thought still to have deliverable atomic bombs, rehabilitation efforts would be futile.

decedent estates and such family relationships as guardianships would mount fantastically in the areas that had sustained attack. A hard-boiled attitude might be that this is luxury business; let the propertied widows go live with their brothers-in-law. But apart from the dislocation of the lives involved, the problems of ownership that would arise if estates were frozen could seriously impede economic adjustments. Who votes the stock in closely held corporations, the shareholders of record being dead or missing? Who is entitled to manage and sell property, to compromise disputed claims, to have custody over minors and incompetents? In normal times the orderly settlement of estates enables us to answer these and many like questions, albeit slowly, after a man of property has died. But suppose the death rate among such men in certain large cities has mounted 1,000 or 2,000 per cent?

And just where, literally, would one find the courts having jurisdiction over these corporate and property problems? Where, for example, would be the United States District Court for the Southern District of New York, which has its seat in lower Manhattan? This is the court which would have jurisdiction over the thousands of insolvencies that would arise in New York City and its New York suburbs. Where would the Surrogate's Court of New York County be? It has jurisdiction over the estates of Manhattan residents.

PROSPECTS FOR PRECAUTIONARY PLANNING

If the picture I have drawn has given the reader a sense of hopelessness, I think he is wrong—in part. The prospect of solving these and countless other problems of like nature for the first time *after* atomic war has begun is truly desperate. If, however, collectively and individually, we had planned

and put into effect measures of the three general types I have outlined above, I believe we could keep post-attack problems to manageable proportions. Indeed, the very process of thinking them through might lead to a wholesome simplification of a good many existing laws, procedures, and private arrangements.

Such study as I have been able to direct to foreign experience in World War II is encouraging. With the outbreak of war, England and Germany, for example, put extensive laws into effect to provide for the handling of war-created legal problems, and the German laws and regulations multiplied as bombing attacks grew. Moreover, I understand we have, in the captured files of German companies now on microfilm, great quantities of elaborate contracts that were devised to meet wartime exigencies. In contrast, I am told, Japan took virtually no protective measures. To do so would have been unpatriotic; the Army had said, "It can't happen here."

We dare not rely too much, however, on European experience as a guide. The problems created by a gradually accelerating tempo of bombing, chiefly at night and by conventional bombs, differ in crucial respects from those which sudden mass obliteration by A-bombing could produce.

EXAMPLES OF NEEDED MEASURES

No single article could canvass the diversity of measures that minimal protection would call for. I shall list only a few of them to indicate some of the principal lines that should be carefully examined without further delay. In this survey I shall omit the problems of health, safety, and order which have been receiving attention, and also the very serious problems of providing adequate stand-by arrangements for the executive arms of local, state, and federal governments—a field thus far covered with various degrees of adequacy

by legislation, chiefly at the state level. My concern will instead be directed to the neglected business of keeping in motion the wheels of our free enterprise, credit economy.

State and federal legislation (except compensation laws)

The credit problem calls for attack in a number of directions. Provision should be made for automatic transfer of bank deposits (either in whole or in part) from stricken areas to predetermined recipient banks, microfilm being used in the mechanics. Moratory laws, carefully tailored to meet a variety of situations, should be devised, a short blanket moratorium to be effective upon attack, to be followed by others of limited applicability. Authority should be given for the prompt appointment of conservators (ordinarily designated in advance) to be vested with wide powers over business and personal estates. Streamlined procedures for administering financially embarrassed corporations are needed; existing ones are hopelessly slow and cumbersome for emergency use. Procedures might even be devised for excising damaged segments of a corporation from the rest of it, prorating creditors' claims against each part so as to enable the undamaged part to become eligible for fresh credit. Government backing of short-term credit, administered by banks, could free business dealings frozen by war hazards, even where no war orders were involved. The need for working capital would probably be urgent; without it, the promise of property restoration or compensation might be like offering an artificial leg to a dying man.

The *force majeure* escape clauses which most well-drawn contracts contain in troublous times might actually prove disruptive. Courts might be given power to keep contracts in effect but to rewrite their provisions equitably, a measure for which both English and

German experience provides precedent. Estate administration would require speedy new procedures, with special attention to the problems of providing survivors with ready resources, even where wills and trust provisions had to be overridden, and freeing property and businesses from dead hands. Flexibility in corporate governance would also be needed. Proof of death should be facilitated.

Effective administration would require a stand-by system of courts, even though this might entail some disregard of state lines. The whole apparatus of notice and time limits governing current procedures would have to be reviewed and revised. Many judicial powers would have to be vested in special masters and referees, especially in stricken areas.

Private arrangements

The arrangements made by individual banks and insurance companies which have come to my attention are ingenious, but I think give inadequate weight to the disruptions occurring outside their walls. The insurance company that has reserved an institution near New York for its staff overlooks the waves of desperate humanity that will engulf the community chosen if an attack really comes. Working out co-operative plans with the government on a much more comprehensive scale seems called for.

Ordinary business concerns, with less public responsibility than the financial corporations, should review their long-term contracts and leases to seek ways of flexibly adjusting obligations to meet atomic war problems—a task which could be given both impetus and guidance by wise trade association leadership. Firms with managements and directorates concentrated in target areas should provide for the automatic transfer of authority to persons outside the area, upon attack. Appropriate voting

trusts might help to meet the problem of shareholders similarly concentrated. Trust companies should enlist safely situated understudies to help them handle the overwhelming duties that would fall on them as trustees for bondholders and as transfer agents.

Estate plans should be reviewed with the contingency of atomic attack in view. The drastic changes in the expectations on which existing plans are based suggest the possibility of vesting in persons outside the danger zone extensive powers to revise estate plans post mortem, pursuant to broad standards that the testators and the settlors could lay down. Safely situated substitute executors, trustees, and guardians should be provided in advance, and arrangements worked out for easy shifts of responsibility.

The law firms have a special responsibility: to provide stand-by correspondents in safe areas who are kept sufficiently abreast of the activities of exposed firms to enable the correspondents to help in an emergency, and who also can make some provision for working space for survivors. If, for example, Philadelphia and Boston were hit, nearby cities like Reading and Worcester could become the seats of much of the legal work of the bombed areas.

Compensation measures

The problem of compensation tends naturally enough to be cast in terms of war risk insurance for property damage, a reflection of the system successfully used in World War II which sustained losses only in the Philippines and made a net profit. It is clear, however, that if atomic attacks were made on metropolitan centers, the volume of war risk insurance carried in World War II would be a drop in the bucket. Moreover, it seems clear that to pay out large sums upon the infliction of damage would simply augment inflationary

dangers. Some combination of limited liability war risk insurance (perhaps with rates graduated to reward the new plant located in accord with dispersal needs) with a long-range program of government compensation, not necessarily providing full coverage, even together, might prove feasible.

The abortive "War Disaster Act of 1951," a bill⁶ drafted by the Bureau of the Budget and the National Security Resources Board and introduced by Senator Frear (by request), never emerged from committee. It not only provided property damage reimbursement but also gave payments to injured and needy victims of attack and to the families of the killed. Provision was also made for reconstructing essential plants and community services and for postwar aid to public bodies. A moratorium on insurance obligations was authorized. The bill was attacked by insurance companies. Whatever the merits of their complaints, it seems evident that the bill amounted to little more than a gallant first attempt to tackle an intricate set of extremely serious problems. In a more thoroughgoing study, incidentally, problems of tax abatement—local, state, and federal—ought to be included.

The problems of planning, public and private, to keep the economy a going concern after atomic attack are hard problems. Two or three years of work would at the shortest be needed to design and install an adequate system. Work should already have been well advanced. It is disquieting, therefore, that the recent Project East River, charged with recommending "the opti-

⁶S. 1848, 82d Cong., 1st sess., introduced July 12, 1951.

imum combination of non-military measures which will assist . . . The Federal Civil Defense Administration to discharge its responsibilities for preparing to minimize the effects of attack . . . on the population and industry of the United States," reported in its long, unclassified report that it had "not had an opportunity to make an intensive study of war risk insurance or of possible systems of war indemnity," the only phase of the economic defense problem which it recognized.⁷

A TASK FOR THE PUBLIC

Planning to design adequate economic defenses is not a task for federal officials working under security and classification restrictions. It is a job for businessmen, bankers, lawyers, and public officials, aided by research help where needed, able to discuss dangers and remedies freely and publicly. Not only would a better set of plans result from this process. For responsible citizens to face the dangers squarely and to learn, through participation in their design, the measures that would be put into effect in case of atomic attack would mean sounder attitudes toward the risk of such attack while peace is maintained and a far more effective response to its terrible impact if war should come.

⁷In Part I of Project East River's report, completed only in October 1952, there is a "Check List of Recommendations," 31 pages long, containing 263 numbered recommendations. Exactly one of these (No. 92)—more research on war risk insurance—deals directly with the problems discussed in this article. The report was prepared under Signal Corps Contract No. DA-49-025-SC-96 by Associated Universities, Inc. (a nonprofit university group which operates the Brookhaven Atomic Laboratory).

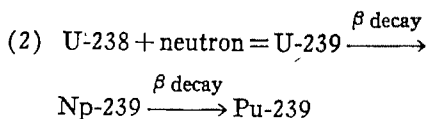
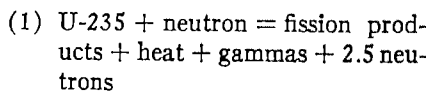
David F. Cavers, B.S. in Econ., LL.B., Cambridge, Massachusetts, is Fessenden Professor of Law and Associate Dean of the Harvard Law School. During World War II he served as Associate General Counsel for Price in the Office of Price Administration. He is an associate of the Special Committee on Atomic Energy of the Association of the Bar of the City of New York, and is author of a number of articles on the international control of atomic energy, chiefly in the Bulletin of the Atomic Scientists.

Economic Technology of Nuclear Power

By JAMES A. LANE

THE utilization of atomic energy depends on the reactions that occur between neutrons and the nuclei of atoms. These reactions can occur in a variety of ways. In the most common nuclear reaction, the nucleus "captures" the neutron forming an isotope of higher atomic weight. This isotope is usually radioactive and decays to form a new element. In the "fission" reaction, the nucleus splits into two parts forming a variety of lighter elements and releasing a number of additional neutrons.

Although many heavy nuclei undergo both fission and capture reactions with neutrons, only a few have a higher probability of fission than capture. Since these few generate excess neutrons and are capable of sustaining a nuclear chain reaction, they are called "fissionable" nuclei. The most common fissionable materials are uranium 233, uranium 235, and plutonium 239. Of these, only the uranium 235 occurs in nature as 0.71 per cent of normal uranium. The remaining 99.3 per cent is uranium 238, which has a very low fission-to-capture probability and does not fission enough to sustain a nuclear reaction. If normal uranium is bombarded with neutrons, two primary reactions occur. These are:

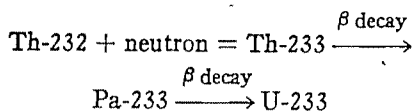


The first reaction is the nuclear fission reaction, and the second is a neutron capture reaction. Only the first

produces the energy for power and neutrons necessary for continuing the reaction.

If the nuclear fuel consists of pure U-235, there will be 1.5 excess neutrons created per fission, and in a mixture of U-235 and U-238, less than this, depending on the relative amounts of these elements present. In natural uranium, the above reactions occur in approximately equal amounts, which means that there are only 0.5 neutrons excess per fission.

Although the neutron reaction with U-238 uses up a neutron, this capture reaction produces an unstable atom U-239 which decays to neptunium 239, and this in turn to plutonium 239. Since Pu-239 is fissionable, each neutron capture in U-238 produces a new atom of nuclear fuel. In a like manner, thorium 232 will capture a neutron and produce U-233 as follows (Pa-233 means protactinium 233):



The large amount of energy released from the fission reaction arises from the fact that the combined masses of the fission products do not quite equal that of the fissioned nucleus, the difference being converted to energy. This manifests itself primarily in the form of kinetic energy of the fission products. These create heat on impact with surrounding atoms of the nuclear fuel.

REACTOR COMPONENTS

A nuclear chain reaction will be initiated spontaneously in a block of pure fissionable material if the number of

neutrons leaking from the surface is less than the excess neutrons generated. A simple system like this, however, is not practical as a source of power, for a number of reasons. First, a large fraction of neutrons leak out; second, there is no method of stopping the reaction; and third, there is no method of removing the heat generated. Consequently, to achieve a practical power generator, it is necessary to add other materials to the nuclear fuel to create more heat transfer surface and remove the heat and to control the rate of heat generation. Thus, the core of a nuclear reactor usually consists of a nuclear fuel, fuel diluent, coolant, and control elements, plus any structural materials necessary to contain or support the components.

In addition to the heat removal components, it is often advantageous to add a certain amount of "moderating" material to the core to slow down the neutrons from their original high velocities. Each time a neutron collides with a moderator atom it loses a fraction of its energy, until finally it is moving at the same velocity as the moderator atoms themselves. At this velocity, or energy, it is said to be "thermal," and nuclear reactors containing moderators are called "thermal" reactors. Conversely, reactors containing no moderating materials are known as "fast" reactors. Since the probability of occurrence of a neutron fission or capture reaction, measured by the nuclear cross section of the atom, changes with the velocity of the neutrons, thermal and fast reactors have considerably different properties.

By using a moderator, one takes advantage of the fact that fissionable materials absorb slow or thermal neutrons more readily than fast neutrons. For this reason, a chain reaction can be sustained in natural uranium with thermal neutrons but not with fast neutrons.

Although many materials of high atomic weight fission to a certain extent with fast neutrons, a fast fission chain reaction can be sustained only in nuclear fuels which contain relatively large percentages of U-233, U-235, or Pu-239. *Thus, fast reactors normally require large inventories of these fissionable materials.* However, such reactors have a considerably higher neutron economy than thermal reactors, and open the possibility of breeding more nuclear fuel from uranium 238 than consumed.

The design of a nuclear power reactor must satisfy two sets of requirements. The first deals with the nuclear system, or in other words the problem of maintaining and controlling the nuclear chain reaction; and the second, the problem of heat removal. To satisfy the nuclear requirements, the production of neutrons must exceed all losses due to absorption and leakage. To do this, the amounts of various materials in the reactor must be so adjusted that there are always excess neutrons available. Since all of the reactor components compete with the nuclear fuel for the capture of neutrons, only certain elements with low neutron absorption cross sections are suitable for use in the reactor. A constant rate of fission or constant heat production rate is obtained by adding neutron absorbers to maintain a delicate balance between neutron production and losses.

CONTROL OF REACTORS

Although the neutron multiplication process takes place in times of the order of milliseconds, not all of the neutrons are emitted instantaneously. Because a small fraction, less than 1 per cent, are emitted from short-lived fission products and are "delayed" as much as a few minutes after the fission occurs, the time between successive generations is

effectively increased. Thus, the delayed neutrons make the control of a reactor practical with mechanically driven rods containing neutron absorbers.

HEAT REMOVAL CONSIDERATIONS

The heat removal requirements of a nuclear power reactor usually dictate the size of the reactor core, although for each nuclear system there is a minimum size or critical diameter necessary to sustain the chain reaction. When the required size is larger than the critical diameter, the excess reactivity is adjusted by adding more neutron absorbing material to the reactor core. This may be either a nonproductive absorber, such as cadmium or boron, or a fertile material such as U-238 or Th-232 which will generate new reactor fuel.

The design of a nuclear power plant usually starts with the selection of the nuclear system with particular reference to the choice of coolant. The most important coolants are air, helium, water, heavy water, and sodium, although others may have merit for specific applications.

For the most efficient power production, the temperature of the coolant as it leaves the reactor should be as high as possible. This determines the thermal efficiency of the system and is an important factor in the economy of nuclear power production. Most of the development effort associated with nuclear power production centers on the problem of operating nuclear reactors at high temperatures. Superimposed on this is the fact that all materials become radioactive and undergo changes in their physical properties in a field of radiation. The combination of radioactivity, radiation damage, and high temperature performance, added to the nuclear requirements, considerably limits the number of materials suitable for use in a nuclear power reactor.

RELATIVE IMPORTANCE OF BREEDERS AND CONVERTERS

Since excess neutrons from fission will react with the fertile materials U-238 or Th-232 to produce fissionable Pu-239 or U-233 respectively, it is possible to generate as much or even more fissionable material in a reactor as it operates than is burned or consumed. The efficiency of this process depends on the relative amounts of fuel and fertile material present, and the extent of the neutron losses due to absorption and leakage. As long as there is some fertile material in the reactor, new nuclear fuel is produced. However, the added contribution that this new fuel makes to the original supply of fissionable material does not become significant until the ratio of new fuel produced to fuel consumed, after allowing for chemical losses, approaches or exceeds one.

The nuclear characteristics of the U-238-Pu-239 system are such that in a fast reactor it is theoretically possible to produce more plutonium than consumed. This type of reactor is commonly referred to as a "fast breeder" reactor, or simply breeder reactor. Thermal breeders may not be practical with Pu-239 as the fuel and U-238 as the fertile material, because of the non-fission-capture of neutrons by the Pu-239 to give Pu-240. However, properly designed thermal reactors which have a high plutonium regeneration ratio may play an important part in an industrial nuclear power program.

In the case of the Th-232-U-233 system, breeding is also theoretically possible in fast and thermal reactors. The relative merits of each type of reactor for nuclear power production from thorium depend more on design and economic considerations than on the nuclear characteristics. Many experts feel that since the difference in neutron economy between these two types is

small, a thermal thorium breeder may have an economic advantage compared to a fast thorium breeder.

The relative importance of the fast breeder, the thermal uranium reactor, and the thermal thorium breeder for nuclear power production will depend on the availability and potential supply of natural uranium and thorium, and the extent of the contribution of nuclear energy to our power supply problem. While it is true that breeder reactors make the most use of natural uranium or thorium, the question is essentially one of economics, since one always has the option of recovering more of these materials from the relatively limitless low-grade sources. The difference between the cost of maintaining a high neutron economy in the reactor in order to regenerate new fuel from the last few neutrons and the cost of recovering low-grade ores may well favor the latter. However, until this is established, the prospect of breeding is attractive enough to justify an extensive development effort in this direction.

Uranium requirements for industrial power

The uranium requirements for fast and thermal power reactors are an important factor in determining the relative merits of these reactors for economic power production. In both types of reactors, a certain amount of natural uranium is required to provide the fuel and fertile material for the initial loading, to supply inventories in the chemical processing plants, and to make up for uranium consumed. In reactors which do not breed, the additional amount of natural uranium required periodically to make up for the net fuel burned or lost during reprocessing is significantly higher than for breeder reactors, increasing with decreasing regeneration ratios.

The reactor inventory requirements

per unit of power produced depend on the efficiency of the heat removal and power production systems. In general, there will be an upper limit to the amount of power that can be extracted from a given amount of fuel, set by practical considerations of coolant pumping power, fuel element design, and reactor operating temperatures. Calculations of the heat transfer characteristics of the core of a reactor indicate that the minimum natural uranium requirement for fuel inventories will be in the neighborhood of 0.2 kilogram per installed kilowatt of electrical capacity for thermal reactors.¹

Since the annual fuel consumption in breeder reactors is negligible, reactor fuel inventories become the important factor in establishing the maximum utilization of nuclear fuels in this type of reactor. Generally, because of the high ratio of fertile material to fuel, the inventory for a fast reactor is approximately two and a half times as large as for a thermal reactor. If the thermal reactor were only to achieve an initial conversion of between .85 and .9 gram of plutonium for each gram of U-235 burned, the total yearly requirements would be equal for both types. This is shown in Table 1, which gives the hypothetical amounts of natural uranium required to produce the initial fuel charge in various thermal reactors and a fast reactor to supply the total power produced in steam plants in the United States in 1951.

Economic considerations

From an economic standpoint, the relatively large uranium inventory in fast reactor systems tends to offset the advantage of lower annual fuel consumption. If one assumes that the annual fixed charges against fuel inven-

¹ J. A. Lane and S. McLain, "The Design of Nuclear Power Plants," *Chemical Engineering Progress*, Vol. 49 (1953), p. 287.

tories, which are a nondepreciating investment, amount to 10 per cent, these inventories are one-tenth as important in determining fuel costs as charges against fuel burned. On this basis, one can calculate an "effective fuel requirement" in fast and thermal reactors by adding one-tenth of the reactor inventories to the annual consumption. The results shown in Table 1 indicate that both the fast breeder and thermal converters have roughly the same effective fuel requirements. In this regard, advances in technology which lead toward lower fuel inventories favor the fast reactor system.

The fuel inventory requirements for fast breeder systems shown in Table 1 assume that each reactor is fueled initially with enriched U-235 produced from virgin ore. After the first few fuel cycles, the plutonium produced is used exclusively as the nuclear fuel, and it is subsequently possible to produce excess plutonium for other reactors. Not only will the sale of excess plutonium reduce the cost of power, but it is possible to expand a nuclear power system based

on fast breeders by successive doublings of nuclear fuel inventories using plutonium plus depleted or waste uranium only.

This freedom from additional virgin ore is usually stated to be the most important attribute of fast breeders. However, the effectiveness of such a system depends on the characteristics of each particular reactor which determine the doubling rates of reactor inventories. For many designs, the fuel doubling times are too long to achieve a significant rate of expansion of the nuclear power system. Even with high doubling rates, there is still a question as to whether it is more economical to expand the nuclear power system through breeding or by mining new uranium ore.

DUAL PURPOSE VERSUS SINGLE PURPOSE REACTORS

In production reactors, as contrasted with power-only reactors, the Pu-239 produced by neutron capture in U-238 is removed periodically rather than allowed to burn in the reactor. As long

TABLE 1—NATURAL URANIUM REQUIRED TO SUPPLY TOTAL U. S. STEAM-PLANT-PRODUCED ELECTRICAL POWER IN 1951

Installed Electrical Capacity = 70×10^6 kw.

Power Produced = 326×10^6 kwh. per year

Thermal Efficiency Assumed = 25 per cent

Type of Reactor	Short Tons of Natural Uranium (or Equivalent)		
	Reactor Inventory	Annual Consumption	Effective Annual Requirement**
Fast Breeder	40,000	200	4,200
Thermal Converters			
a. $g_0^* = 1.05$	15,000	700	2,200
b. $g_0^* = 1.0$	15,000	1,100	2,600
c. $g_0^* = 0.95$	15,000	1,700	3,200
d. $g_0^* = 0.90$	15,000	2,500	4,000
e. $g_0^* = 0.85$	15,000	3,500	5,000
f. $g_0^* = 0.80$	15,000	5,500	7,000

* g_0 = Initial regeneration ratio, defined as the atoms of Pu-239 produced per atom of U-235 consumed *at the start of the cycle*.

** Effective annual requirement = one-tenth inventory plus annual consumption.

as a military requirement for atomic weapons exists, the plutonium has a strategic value greater than its value as nuclear fuel. The revenue obtained by operating a reactor as a dual purpose reactor, producing plutonium for military use and power for industry, is greater, therefore, than that for a power-only reactor. Studies by industrial participation groups indicate that because of the enhanced value of plutonium, the by-product power from dual purpose reactors is economically competitive with power from conventional sources. Consequently, dual purpose reactors provide an economic incentive for industry to develop nuclear power technology.

Although the dual purpose reactor approach provides a short-term incentive for industrial nuclear power, the long-range implications of such a system are not great. First of all, the economics of power production are closely tied to the requirements for weapon-grade plutonium, which cannot be predicted with certainty. Second, the economics of dual purpose reactors favor designs which emphasize plutonium production and minimize power production. For this reason there is a question whether such a program is a direct step toward economic power. Finally, the contribution that the available natural uranium can make to our industrial power supply via the dual purpose approach is limited to that obtained by burning a portion of the U-235 present. For the case considered in Table 1, the annual uranium requirement in dual purpose reactors amounts to 15,000 tons, compared to 200 tons for the breeder.

PROBLEMS OF ESTIMATING PROBABLE COSTS

Most estimates of the cost of a nuclear power plant start with the premise that the reactor and its associated facilities replace the boiler and fuel handling equipment in a conventional plant—in

other words, the steam-producing facilities. The remainder of the plant, which includes the turbogenerator, the condenser, and the accessory electrical equipment, is usually considered to be unaffected by the substitution of a nuclear boiler plant for the conventional fuel-fired boiler, if the steam conditions remain unchanged. If limitations of reactor operation prevent achieving conventional high-pressure steam conditions, turbine and condenser costs must be adjusted to allow for lower-pressure operation.

Thus the starting point of probable nuclear power plant costs is the average cost of a conventional plant. For large plants with capacities of 100,000 kilowatts or greater, this is estimated to be \$150 per kw. capability, or \$170 per kw. of rated capacity. The first of these two numbers, which takes into consideration the fact that on an average plants actually operate about 14 per cent above the rated load, is probably the most realistic basis. Since one-third of the investment cost is represented by steam-producing facilities, the cost of the turbogenerator section of a nuclear plant amounts to about \$100/kw. as long as such a plant produces steam at 1,200–1,500 pounds per square inch pressure. For operation with steam at 500 pounds per square inch pressure, this cost would be \$110/kw., and at 200 pounds per square inch, about \$130/kw.

With regard to the cost of the nuclear portion of the plant, estimates vary widely. Early guesses range from \$50/kw. to \$250/kw. More recent studies by industrial participation groups have failed to narrow the range, and vary from \$140/kw. to \$700/kw., depending on the type of reactor considered. For the most promising types of thermal reactors, such as pressurized water reactors, aqueous homogeneous reactors, or sodium graphite reactors, the esti-

mated costs lie between \$140/kw. and \$300/kw. Total plant costs for these systems will range from \$270/kw. to \$430/kw.

The cost of power due to these investment costs depends on the rate of fixed charges and the load factor or number of kilowatt-hours produced per kilowatt of capability. Depending on plant locations and other factors, fixed charges will vary from 10 to 15 per cent, and load factors from 70 to 90 per cent. Taking an average fixed charge of 13 per cent and an 80 per cent load factor, the investment costs in a nuclear power plant will be between 5 mills/kwh. and 8 mills/kwh. With less optimistic assumptions, investment costs might be one or two mills/kwh. higher.

The problem of estimating probable fuel costs in nuclear plants is more difficult, since this involves unknown factors such as the ultimate cost of uranium ore and uranium metal at various enrichments, and the cost of fabricating complex fuel elements and reprocessing irradiated fuels. In addition, the market value of the plutonium produced in the fuel, as well as other possible by-products, may have an appreciable effect on the net cost of nuclear fuels.

In spite of uncertainties, it is possible to arrive at an order of magnitude of fuel costs from published values of the cost of natural and enriched uranium. W. H. Zinn² gives the cost of natural uranium metal as \$35 per pound, and of enriched uranium as at least \$20 per gram. Using the effective annual fuel requirements of various types of reactors given in Table 1 as a basis, the corresponding cost of fuel varies from 0.5 mills/kwh. to 1.5 mills/kwh. for natural uranium. The cost of enriching and reprocessing the fuel is not included. If enriched fuels are required, costs may

be considerably greater than the minimum values given here.

Since there is no experience available on the operation of a nuclear power plant, it is difficult to predict how the added complexity of such a plant will affect operating costs. The best guesses to date indicate that operating costs of nuclear plants may amount to about 2 mills/kwh., or twice the average of conventional plants.

The total cost of electricity at the bus bar in large nuclear power plants, based on the most recent published information, is seen to vary from 7.5 mills/kwh. to 11.5 mills/kwh. Corresponding costs for average new conventional plants of the same capacity amount to 6.7 mills/kwh., which means that nuclear plants are not competitive at the present time.

AEC REACTOR DEVELOPMENT PROGRAM

The present Atomic Energy Commission reactor development program, although motivated primarily by the need to build mobile reactors for military use, has made great strides toward establishing the conditions under which various nuclear systems are suitable for power production. At the present time there are at least five nuclear reactors being developed in Commission-owned laboratories, which are capable of producing power. These are:

1. Submarine Thermal Reactor—Westinghouse
Argonne National Laboratory
2. Submarine Intermediate Reactor—General Electric Company
3. Aircraft Reactor—General Electric Company
Oak Ridge National Laboratory
4. Experimental Breeder Reactor—National Reactor Testing Station, Idaho
Argonne National Laboratory
5. Homogeneous Reactor Experiment—Oak Ridge National Laboratory

² W. H. Zinn, "Basic Problems in Central Station Nuclear Power," *Nucleonics*, Sept. 1952.

Only the last two of these reactors are aimed directly at the industrial power program and have actually succeeded in producing electricity; however, the primary objective of all approaches has been technical feasibility. In order to achieve industrial nuclear power, it remains to extend the technology of these and other promising nuclear systems along lines leading to greater economy of nuclear fuels and reactor investment costs.

As a supplement to the technical development effort in the laboratories, members of the Commission's staff have been constantly examining reactor designs which promise economical central station electric power, and about two years ago were joined with some of the country's best power talent. Most of this effort has been applied to dual purpose reactors, on the assumption that the simultaneous production of plutonium and power is attractive. Sharing costs would lower the cost of each product, it was reasoned, and in this way plutonium production would aid the development of power reactors. Subsequent review of the need for plutonium from dual purpose reactors has lessened interest in these reactors and has shifted the emphasis to power-only systems.

INDUSTRIAL PARTICIPATION STUDIES

Independent studies of reactor technology and promising reactor designs have been made by several firms interested in the commercial possibilities of nuclear power and reactor products. This activity, known as the industrial participation program, placed initial emphasis on dual purpose units; but now the participants are seeking economical designs whose primary product would be electric power. Increased interest in nuclear power production is evident, since the number of member firms participating in the four original study

groups had increased from eight in 1951 to more than fifty in 1953. A fifth group with eight clients started a new series of studies in September 1952.

The four groups in the first round of studies submitted reports in the summer of 1952. Condensed, declassified versions of these reports have been published by the Government Printing Office.⁸ The characteristics of the reactor designs studied are summarized in Table 2.

All four industrial groups concurred in the belief that dual purpose reactors were technically feasible and could be operated in such a fashion that the plutonium credit would make the cost of power competitive with that from conventional coal-fired plants. Conversely, all agreed that no reactor could be constructed in the very near future which would be economical on the basis of power generation alone. As a final comment, all four groups expressed willingness and desire to continue their efforts with more detailed studies and component development.

FUTURE PLANS AND ALTERNATIVES

The conclusion of the first round of economic studies by industry and the successful demonstration by Commission laboratories of the technical feasibility of various nuclear reactors for producing power bring to an end the first phase of the program directed toward industrial nuclear power. This may be also a turning point in the road toward economic nuclear power, with emphasis shifting from a military-motivated, government-sponsored program to a purely industrial program.

The rapidity with which the responsibility will shift, however, depends on

⁸ "Reports to the U. S. Atomic Energy Commission on Nuclear Power Reactor Technology," Washington: Government Printing Office, May 1953, 25 cents.

the solution of a number of legal problems which act as barriers to the entry of business into this field on a private investment basis. These are largely the result of provisions of the Atomic Energy Act passed six years ago to meet conditions existing at that time. For this reason, new legislation is being recommended by the Commission which will create a more favorable environment for private investment in nuclear power production.

The major changes proposed permit groups other than the Atomic Energy Commission, including private enterprise, to own nuclear equipment and fuels with appropriate safeguards, more liberal patent agreements, freer dissemination of required technical information, and a more realistic policy regarding reactor isolation measures. Although the legislation being recommended contains no commitment for purchase of plutonium, it does include provision for government purchase of all reactor products, if it is in the interest of national security.

Since future plans are governed by the outcome of the proposed legislation, the government program for nuclear power development cannot be defined at the present time. In general one of

four possible courses of action may be adopted. These are:

1. Create favorable legislation and let industry develop nuclear power on its own. This means an essentially long wait until rising coal prices or normal technical developments bring nuclear power into a competitive position with respect to conventional plants.

2. Underwrite the cost of the nuclear portion of the plant by owning and renting to industry the reactor and nuclear fuel. This not only sidesteps the need for legislative changes, but absorbs the risk involved in the first generation of nuclear power plants which public utilities are not in a position to assume.

3. Encourage industry to build small-scale power plants by supplying uranium fuel inventories and processing depleted fuel elements at minimum cost, and support such effort by research in Commission laboratories.

4. Continue the development program on its own initiative on a parallel to the industrial effort to the point where reliable and economical nuclear power is a reality.

Whatever be the outcome of the proposed legislation and the various debates concerning government (including non-AEC units such as a municipal sys-

TABLE 2—REACTOR DESIGNS STUDIED BY INDUSTRIAL PARTICIPATION GROUPS

Group	Reactor Type	Fuel	Electrical Power, kw.	Cost \$/kw.
Chicago ^a	1. He cooled, graphite moderated	nat. U	47,000	850
	2. Pressurized heavy water	nat. U	211,000	435
Michigan ^b	1. Cast slurry fuel fast breeder	highly enriched U or Pu	138,000	—
Pacific ^c	1. Pressurized heavy water, light water cooled	nat U	106,000	350
	2. Fast breeder	highly enriched U	145,000	350
St. Louis ^d	1. Sodium cooled graphite moderated	1% U-235	210,000	475

^a Chicago Group—Commonwealth Edison and Public Service of Northern Illinois.

^b Michigan Group—Detroit Edison and Dow Chemical Company.

^c Pacific Group—Bechtel Corporation and Pacific Gas & Electric Company

^d St. Louis Group—Monsanto Chemical Company and Union Electric Company

tem) or private development of nuclear power, it is becoming increasingly evident that some form of co-operative program between the Commission and industrial groups is desirable. Certain features of such a program will remain government responsibility; for example,

controlling and supplying fissionable materials, and supporting nuclear research in existing facilities. On the other hand, the phases of the development program which deal with application of nuclear energy to commercial power production will be the responsibility of industry.

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Economic Feasibility: The Dual Purpose Reactor

By WALKER L. CISLER

THE term "dual purpose reactor" as used herein refers to those nuclear power reactors which produce both useful power and fissionable materials, uranium 233 and plutonium. Included in this category are several different types and designs of thermal and fast reactors, whether breeder reactors or other.

The fissionable materials produced by dual purpose reactors might be used either for commercial purposes or for weapons. There is no implication whatever that they necessarily would be purchased by the government.

Inasmuch as commercial-size reactors intended for these purposes have not been fully designed or built, construction and operating cost data are not available. Any discussion of economic feasibility, therefore, becomes a consideration of the objectives in building such reactors and of the reasons it is believed that one or more designs of dual purpose reactors hold promise of meeting those objectives.

In such a discussion we should remember from the start that by its nature, any nuclear reactor produces heat, neutrons, and fission products. The main difference between dual purpose and single purpose reactors is largely the completeness with which these products are used. With power-only reactors, the main effort is directed to the utilization of the heat. In dual purpose reactors, an effort is made to conserve and utilize the neutrons by transmuting fertile materials into fissionable materials.

MAIN OBJECTIVE—UTILIZATION OF HEAT ENERGY

While it is recognized that the atomic energy development may have many

diverse influences on our economy, the main objective of the power industry is the utilization, on a commercial, competitive basis, of the heat energy which is made available by nuclear fission. The most promising use of that heat energy at present is in the generation of electric power, but other industrial applications for using that heat may be developed at some future time.

We in the United States are fortunate in that we have available vast resources of energy in the form of fossil fuels and, to a lower degree, falling water. By comparison with the rest of the world, the cost of fuels is low in most parts of our country, and, as a result, abundant supplies of electric power are available at quite low costs in all but inaccessible and remote parts of the United States.

The peacetime uses of atomic energy should be considered as a normal industrial development similar to that which has occurred in our coal, gas, and petroleum industries. The development will extend over many years into the future, and the things we do now may greatly influence the ultimate accomplishments. Many important factors must be taken into account when considering the type of reactors which may be economically feasible. Four of these are discussed in the following paragraphs.

LONG-TERM ECONOMIC CONSIDERATIONS

The method of utilizing nuclear fuels for the generation of electric power must be compatible with the long-time economic needs of our country and of the world. The potential heat resources of uranium and thorium are extremely large if they can be completely utilized. These heat resources, however, consid-

ering only natural fissionable material, U-235, are but $\frac{1}{140}$ as great as the energy in uranium alone.

For the practical commercial generation of electric power, the processes should aim to utilize all the potential heat in the fertile and fissionable materials, and not just a fraction of that heat. From the standpoint of long-time economies, the discarding of a large part, or even a significant part, of those potential heat resources cannot be justified.

From our appraisal of present-day reactor technology and processing techniques, we believe that the breeder reactor with a suitably integrated fuel element and blanket processing system still holds the greatest promise of meeting this condition. A breeder reactor, after its initial charge of fissionable material, would produce its own fuel from fertile but nonfissionable atoms. It would make use of the full potential heat resources in the uranium which it used. It is even possible that fertile but unfissionable atoms which have been discarded as waste from the present production operations of the Atomic Energy Commission might be utilized.

Breeder reactors, because of their ability to produce more fissionable atoms than they consume, hold the promise of making our country independent of foreign sources of raw uranium. Our domestic resources of uranium, whether vast or not, will be adequate for our needs for a very long time if we further develop and exploit the technology of "breeding." This perhaps is one of the most important matters in the entire atomic development.

There is some evidence that certain thermal reactors can be operated so as to approach and perhaps even reach the goal of using all the heat resources of uranium. Information concerning the technical problems which are involved

has not been released for publication. It can be assumed, however, that fissionable material would be produced in such reactors and that they would come under the dual purpose classification.

COMPETITIVE ASPECTS

The use of nuclear fuels for the generation of electric power must be competitive with other methods. The cost of electric power produced with nuclear fuels must be no more, and preferably substantially less, than the cost of power produced with conventional fuels or with hydraulic energy.

There are in the United States today abundant fuel resources, particularly coal, available at comparatively low cost. Naturally, the actual cost of the fuel depends to a large degree upon the cost of transportation to the location where it is used, but there is adequate fuel for the generation of electricity for many years. In certain sections of the country there are large hydraulic resources, but the more economical sites have been developed or will be developed in the near future.

The thermal generation of electric power is highly developed, and new advances are being made continually. Each year shows a small additional decrease in the average amount of heat energy required to produce a kilowatt-hour of electricity.

Through a network of transmission lines and distribution systems, electric power is available in all but the most remote areas of our country; and for those areas, power can be supplied in several proved ways when the real need arises, at a cost which is not exorbitant.

The use of nuclear fuels for electric power generation in the United States, therefore, must be fitted into an existing highly developed, efficient, electric power supply system. And nuclear fuels, if they are to become a part of that system, must bring a further ad-

vance by making the cost of power to the customer less than the cost of that from conventional sources.

Since there are obvious advantages in developing the practical commercial use of this new heat resource, every possible method of making its use competitive must be given full consideration. One possible means is the reduction in cost of reactors and processing. Another is the production of reactor by-products, fissionable materials and fission products, which can be sold for private use or for weapons.

Plutonium has an inherent value as a fuel, one gram having the equivalent of 23,000 kilowatt-hours of heat energy. Many possible uses of plutonium as a fuel are being considered, and their development will come rapidly when plutonium becomes available for such purposes.

If the operation were regarded as the production of power, with plutonium as a by-product, then the operation would be credited with the net value of the plutonium. This could go far toward making the use of nuclear fuels competitive, and is one of the promising methods for further development.

In the Dow Chemical-Detroit Edison Nuclear Power Study Project, it has been assumed that for commercial purposes the method which would produce the greatest total return per unit of heat handled should be the most attractive. This has led to the conclusion that the breeder reactor has the greatest potential economic feasibility.

With the breeder reactor more fissionable atoms would be produced by the transmutation of fertile atoms than would be consumed in the process. Thus, in addition to producing all of the fissionable atoms required for its operation, fissionable materials would be available for sale for other purposes.

The lack of specific data concerning construction and operating costs pre-

vents any real evaluation of competitive costs. We can rely upon the judgment of those familiar with potential future developments, that at some time competitive conditions are within reach if full advantage is taken of all possibilities. Dual purpose reactors, because they can produce fissionable materials which ultimately will be in industrial demand, are believed by many to have the best possibilities in this respect.

PRIVATELY OWNED ATOMIC ENERGY INDUSTRY

If atomic energy and nuclear fuels are to assume their proper places in our competitive industrial system, then an entire atomic industry must be established. Nuclear fuels for the generation of electric power should be available through normal commercial channels, and industry should not be dependent for fuel requirements upon government-owned facilities intended for military purposes.

If such an industry is to be established, it should have commercial sources of the feed materials, natural uranium and thorium, as well as the fissionable material. Since it is improbable, because of their very high cost, that facilities for the isotope separation processes will ever be built by private industry, the fissionable materials obtainable for commercial operations in the long run will of necessity be reactor products, either plutonium or U-233.

Dual purpose reactors intended primarily for power generation will probably be the chief source of fissionable material for industrial use. They can thus be the foundation for the broad use of nuclear fuels for power generation and other purposes.

Much of the current discussion concerning dual purpose reactors assumes (1) that the plutonium which is produced by power reactors must be sold to the government and (2) that the

supply of plutonium will soon exceed the requirements for weapon use. Certainly if all financial risk is to be avoided, an agreement for purchase by the government would be most helpful. This, however, is not wholly consistent with our free enterprise principles.

If we have faith in the future of the atomic energy development, the lack of a government-guaranteed market for plutonium should not be a limiting factor. The successful development and operation of a nuclear power reactor which is commercially and economically justified will be followed by the construction of additional reactors. There will be a growing and expanding industry. Ultimately the use of nuclear reactors should expand to propulsion units for commercial ships and perhaps for other purposes.

As the industry grows there will be an increasing demand for fissionable materials for the initial inventory and for operating fuel. A little thought will indicate that these needs can be met only by industry's own facilities, and that there is little likelihood that there will be a surplus of fissionable materials which can be used for commercial purposes for many years once successful power reactors actually are demonstrated.

These thoughts can lead to the conclusion not only that dual purpose reactors have greater economic feasibility but that the atomic industry as it is envisioned probably cannot develop unless reactors of this kind have a predominant role.

NATIONAL DEFENSE

Any facilities using nuclear fuels should be of a kind that can contribute to the military strength of our country in time of need. It has been the history of our country to depend upon its peacetime industrial strength to carry the major burden in time of war. We

could not survive otherwise. When the need develops, automobile factories manufacture airplanes, tanks, and artillery. Button manufacturers produce gun sights and all manner of military devices.

Atomic weapons are becoming an increasingly important aspect of our national defense. While plans may be made for the production of adequate amounts of fissionable materials, experience has shown that in times of distress there is always a need for more and more military materials.

Dual purpose reactors would be particularly appropriate for this situation. Under normal circumstances, they could be operated for maximum power or maximum plutonium production, as economics warrant. They would be an added item of our industrial strength which when needed could assume a most vital part in defense activities. The government, therefore, would not need to have in stand-by, production facilities capable of supplying the entire wartime needs of fissionable materials.

SUMMARY

The atomic energy development is still in its early stages. Our efforts in carrying this development forward should be directed toward providing an atomic industry which will contribute most effectively to the economic and social advance of our country and the world. To that end, we should seek to develop nuclear power reactors which will be most effective in creating a thriving peacetime atomic industry, independent of foreign sources of raw materials, and which will also be capable of helping to meet our military needs.

One of our most important needs is sources of fissionable materials which can be used for competitive industrial enterprises. Dual purpose reactors, and in particular breeder reactors, appear to

be the only means of meeting this need on a competitive industry basis.

In the future, after this need is met, after the commercial availability of fissionable materials is established, there will be numerous possibilities with respect to reactor development. It is possible to envision whole families of reactors—power-only units for the propulsion of commercial ships and of some land-based power plants where the use of very high quality fuel can be justified. In such an economy there will

surely be a place for nonbreeder reactors which have a high conversion factor.

All of these, however, must await the establishment of adequate sources of fissionable materials. The most likely source of fissionable materials on a commercial basis is dual purpose power reactors.

Thus it appears that dual purpose reactors, and especially the breeder reactor, have the greatest economic feasibility.

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Economic Feasibility: The Single Purpose Nuclear Power Plant

By GEORGE L. WEIL

THE hope that nuclear energy can supply a substantial fraction of the world's future energy requirements is based on the potential economic performance of power-only nuclear plants. These so-called single purpose plants would be designed with the sole objective of producing power as cheaply as possible. They might simultaneously produce by-products having a market value, the revenue from the sale of which would be used to offset a part of the power production costs. Nuclear fuel is certain to be one of the by-products of the special type of single purpose plant known as a "breeder." However, in the case of the single purpose plant it is assumed that the value of the by-products, including nuclear fuels, will be a relatively small fraction of the value of the power, and therefore will not have a significant influence on the design and operation of the plant

DISTINCTION BETWEEN SINGLE AND DUAL PURPOSE PLANTS

The purpose of this article is to discuss the prospects for competitive power from single purpose nuclear plants, considering both plants that might be constructed within the next few years and plants based on improvements in design and operating characteristics that might be expected in the long term. At the outset, it is important to recognize the basic distinction between the type of plant which makes power its primary product, and the dual purpose type of plant which has been proposed as a way to produce cheap nuclear power now. The dual purpose plant would

produce plutonium for the military as its major product, and power as a by-product. Its economic feasibility would be guaranteed by a military demand and price for the plutonium.

The technical feasibility of the dual purpose operation, like the potential economic feasibility of the single purpose operation, is inherent in the dual nature of a nuclear reactor, since both energy and neutrons are released in the basic fission process. The energy can be converted to useful forms; the neutrons can be utilized to produce new fissionable material, for example plutonium. This, in the case of the single purpose plant, would be returned to the plant as a fuel, or, in the case of the dual purpose plant, turned over to the military for use in atomic weapons. Because of the disproportionately high value of plutonium as material for atomic weapons as compared with its value as a nuclear fuel, a dual purpose plant must be designed and operated to maximize performance for the production of plutonium at the expense of power. This requirement compromises its value as a source of reliable information on the capability of our present technology to produce cheap nuclear power.¹ Because the production of nuclear power, if it is to be a useful and widely used industrial operation, cannot be tied as a by-product to relatively limited and uncertain military needs, our interest in this article will be confined to examining the competitive status

¹ George L. Weil, "Power-Only Reactors—The Direct Approach to Economic Nuclear Power," *Nucleonics*, Vol. 11, No. 4 (April 1953), pp. 12-15, 60.

and potentialities of power production from single purpose plants.

PLANT DESIGNS

Many variations in design of a power-only nuclear plant have been developed by groups engaged in the field of reactor development. There are alternatives in the selection and combination of moderator, coolant, fuel, neutron energy, and other basic elements of design. Some designs use heavy water as moderator, some light water or graphite; some use light or heavy water as coolant, others a liquid metal or gas; some use solid fuel, some liquid or molten; some use natural uranium, others slightly or highly enriched. Many of the possible designs are in advanced stages of development and appear to be equally feasible. Large-scale plants could be constructed within the next year or two with confidence that they would operate satisfactorily as planned. Other designs are in the conceptual stage, and require various amounts of research and development before confidence can be placed in their technical feasibility. In all cases, however, including even those plants of most advanced design, there are substantial uncertainties with regard to the construction costs and over-all economic performance as power producers. These uncertainties increase rapidly with the decrease in development of the plant design.

Combined with our inability to make good cost and performance estimates is the fact that many cost elements necessary for even a qualitative evaluation of the economics of nuclear power plants are classified secret. In spite of the present limitations, consideration of the information that is available and can be discussed throws some light on roughly where we stand today, on the future prospects of competitive nuclear power, and on the major technical problems

that must be attacked if nuclear power is to become a significant factor in the world's industrial economy.

Today one cannot make a choice as to what plant among the possible designs would provide the cheapest energy for application in either the immediate or the long-term future. Though one design may use a cheaper material, it may be less efficient or more expensive in some other respect. No attempt will be made in this article to analyze and compare the advantages and disadvantages of all the possible basic designs. Within the precision of our ability to predict performance and make cost estimates, the discussion that follows may be considered to be generally applicable to the single purpose type of nuclear power plant.

COST ELEMENTS

It is convenient to discuss the economics of nuclear power production from single purpose plants by comparing the major elements that determine the unit cost of energy with the corresponding breakdown of costs of energy from conventional plants. The cost of production of electric energy may be allocated to three general categories: (1) fixed charges on investment in plant and equipment, (2) cost of fuel and fuel handling, and (3) operating expenses exclusive of fuel handling. Table 1 shows the percentage contributions of these elements to the present average cost of energy from conventional plants.

We will first compare the contribution of fixed charges to the cost of energy from nuclear power plants. The contribution of the fixed charges to the cost per kilowatt-hour is determined by (1) the cost of plant and equipment (including land) per kilowatt of electric generating capacity; (2) rates for insurance, interest, taxes, and plant amortization; and (3) the plant ca-

TABLE 1—BREAKDOWN OF AVERAGE COST OF ENERGY FROM CONVENTIONAL POSTWAR THERMAL ELECTRIC POWER PLANTS

Type of Cost	Energy Cost*	
	Mills/kwh.	Per Cent
Fixed charges on investment in plant and equipment	4.75	.55
Fuel and fuel handling	2.65	35
Operation and maintenance	1.00	10
	8.40	100

* At the bus bar.

Source: A. E. Knowlton, "7th Steam Station Cost Survey," *Electrical World*, Vol. 136, No. 9 (August 1951), pp. 97-108.

capacity factor, or number of kilowatt-hours produced per year compared to the plant's maximum capability.

For large modern conventional plants, with generating capacities in the range of 200,000 kw., the investment cost per kilowatt runs between \$150 and \$200. In comparison, current estimates for nuclear power plants run considerably higher. A nuclear power plant will incorporate standard turbine and generator equipment for converting heat energy into electric energy. The nuclear reactor and its associated equipment will merely replace the conventional boiler and fuel-handling equipment. Although no detailed estimates are available that refer strictly to single purpose power plants, there are estimates for dual purpose plants studied by industrial groups. These are shown in Table 2. Within the precision of the estimates, these costs may be taken as a guide to the range of cost of power-only plants. The average plant cost of \$530 (\$382 before contingencies, overhead, and so forth) per kilowatt of electric generating capacity (from Table 2) indicates that one of the major problems facing the development of cheap nuclear power

is the design of plants with low capital costs.

It is worth noting that if nuclear fuel and fuel handling costs can be made negligible, then a higher investment per kilowatt of generating capacity can be tolerated and still provide power at a cost competitive with that in conventional plants. Under the best of circumstances, this credit for fuel might allow a doubling of nuclear power plant cost per kilowatt compared to present costs of conventional plants. However, little will be gained economically if all the credit that can be obtained from the unique potentialities of costless nuclear fuel must be used up in covering greater expenses in plant and equipment.

It is not difficult to understand why the estimated capital costs for a nuclear plant are high. Reactors are complicated machines, they use special materials of exceptionally high purity, and they require, for public protection against hazards, extraordinary plant design features and substantial land for plant sites.

The broad objectives of a development program concerned with plant design must be (1) application of imaginative technical development and design engineering to reduce the capital costs per unit of generating capacity; (2) development of processes for production of cheap reactor materials; and (3) development of designs and components which will assure that nuclear power plants represent no more serious public hazards than are acceptable in other industrial operations.

The annual fixed charges on investment in plant and equipment are determined by taxes, insurance, interest, and depreciation (including obsolescence). Of these, the one having the largest uncertainty and the greatest effect on the over-all cost per kilowatt-hour is depreciation.

TABLE 2—ESTIMATED COSTS OF NUCLEAR POWER PLANTS
(In millions of dollars)

	Gas Cooled ^a	Heavy Water Cooled ^a	Light Water Cooled ^b	Sodium Cooled ^a
Reactor and associated equipment	\$11.7	\$52.4	\$21.1	\$29.1
Turbogenerator equipment	4.3	14.3	12.1	13.0
Structures	4.2	10.0	4.2	5.0
Site and other land costs	1.5	1.6	.7	.7
Miscellaneous	5.3	8.6	2.9	3.2
Total ^c	27.0	86.9	41.0	51.0
R & D, Engineering contingencies	7.6	15.7	8.2 ^d	10.2 ^d
Total direct cost	\$34.6	\$102.7	\$49.2	\$61.2
Overhead 15 per cent	5.4	15.3	7.4 ^e	9.2 ^e
Grand total	\$40.0	\$118.0	\$56.6	\$70.4
Gross electric generating capacity (kw.)	60,000	240,000	106,200	154,600
Cost/kw. electric generating capacity	\$667	\$492	\$530	\$455
Cost/kw. generating capacity before R & D, engineering contingencies, and overhead	\$450	\$362	\$386	\$330

^a Commonwealth Edison Co.—Public Service Co., "Report on Power Generation Using Nuclear Energy," in *Reports to the U. S. Atomic Energy Commission on Nuclear Power Reactor Technology* (Washington: Government Printing Office, 1953), pp. 15, 38.

^b Pacific Gas & Electric Co.—Bechtel Corp., "Industrial Reactor Study," *ibid.*, p. 82.

^c The plant and equipment costs do not provide facilities for processing or fabricating fuel. These costs are customarily treated as part of the fuel expenses.

^d This item not provided by source. Assumed 20 per cent of plant and equipment cost.

^e This item not provided by source. Assumed 15 per cent of total direct cost.

It is usual for power utilities to depreciate plant and equipment over a twenty-year period. The economic justification for this rate is based on a great deal of practical experience with conventional power production. No such experience is available for the reactor and its associated equipment in the case of nuclear power plants. Over and above the usual effects that determine the useful life of conventional plant and equipment, the nuclear reactor must contend with the effects of intense radiation on the life of the materials that are integral parts of the plant, and the feasibility of maintaining vital components. Because there is no reliable method of estimating the useful life of the reactor portion of a nu-

clear power plant, the tendency is to be conservative and assume a five-year period. Perhaps 70 to 80 per cent of the total investment in a nuclear power plant might be subject to a high rate of amortization. Table 3 shows, for private utility financing, the effect of different amortization periods on rates of fixed charges. The table indicates that for an amortization period of five years, the annual rate of fixed charges would be more than double that used for conventional plants.

The combination of high annual rate of fixed charges and high capital cost per kilowatt of generating capacity represents a substantial initial handicap that nuclear power must eventually overcome.

TABLE 3—FIXED CHARGES FOR DIFFERENT AMORTIZATION PERIODS*
(Per cent of capital)

	Amortization Period		
	5-year	10-year	20-year
Return	6.0	6.0	6.0
Depreciation (5% sinking fund)	18.1	8.0	3.0
Taxes based on income	2.5	2.5	2.5
Property taxes	2.0	2.0	2.0
Insurance	.1	.1	.1
Total	28.7	18.6	13.6

* Fixed charges, not including depreciation, equal to 10.6 per cent.

Source: Pacific Gas & Electric Co.—Bechtel Corp., *op cit.* Table 2, note b, p. 84.

The contribution of annual fixed charges on plant investment to the unit cost of energy produced depends upon the total number of kilowatt-hours produced by a plant during a year. For every kilowatt of plant generating capacity, a yearly maximum of 8,760 kilowatt-hours of energy is possible. The percentage of this actually produced is referred to as the plant capacity factor. For conventional postwar plants, this factor averages 75 to 80 per cent. Clearly, nuclear plants, because of their anticipated high annual fixed charges, will have to be operated at high capacity factors, as close to 100 per cent as possible, in order to reduce the amount of fixed charges allocated to each unit of energy generated.

Table 4 shows the fixed charges portion of the cost of electric energy, in mills per kilowatt-hour, for a range of values of unit plant cost and for different amortization periods. For comparison, the fixed charges for large conventional steam-electric plants run about four to five mills per kilowatt-hour.

FUEL COSTS

We consider now the contribution of fuel costs to the cost of electric energy

generated by nuclear plants. It should be evident from the preceding discussion of fixed charges that the successful development of large resources of negligible cost nuclear fuel will be a prerequisite to large-scale competitive nuclear power, since this is the only way in which higher fixed charges for nuclear plants can be offset.

The large potential economic advantage that nuclear fuel has over conventional fuels lies in its much greater concentration of energy. One pound of nuclear fuel is equivalent in heat content to roughly 1,300 tons of coal. The consumption of one pound of nuclear fuel in a nuclear power plant would produce about 34 billion B.T.U.'s (British thermal units) of heat energy. If this thermal energy were converted into electric energy, with a net efficiency of say 25 per cent, we would obtain 2.7 million kilowatt-hours, as compared to about one kilowatt-hour which is obtained from one pound of coal consumed in a conventional steam-electric plant.

Although such comparisons indicate at least a weightless fuel, the important question is whether in practice it is a costless fuel. In exploring this question we find ourselves limited because

TABLE 4—CONTRIBUTION OF FIXED CHARGES TO COST OF ENERGY FOR DIFFERENT AMORTIZATION PERIODS

Capital Cost per Kilowatt Generating Capacity	Energy Cost* (mills per kilowatt-hour)		
	20-year amortization (13.6%)	10-year amortization (18.6%)	5-year amortization (28.7%)
\$100	1.7	2.4	3.7
\$200	3.4	4.7	7.3
\$300	5.2	7.0	11.0
\$400	6.9	9.4	14.6
\$500	8.6	11.8	18.3
\$600	10.4	14.2	22.0

* Plant capacity factor of 80 per cent assumed.

certain information on process costs and fuel utilization are withheld for security reasons. However, it is possible to arrive at some general conclusions with regard to the current range of nuclear fuel costs, the major technical problems that determine these costs, and the developments that will be required to maintain lower costs as raw materials become limiting. This discussion is necessarily oversimplified.

We begin with an official Atomic Energy Commission price of \$3.50 per pound for uranium oxide contained in ore averaging about 0.2 per cent uranium oxide.² Since no further official information is available, we must now extrapolate to establish a reasonable cost for the nuclear fuel after it has been refined from the ore and fabricated into fuel elements ready to be charged into a nuclear power plant. One possible approach has been to assume that the refining and fabrication process increases the original cost by a factor of ten, or to \$35 a pound.³

If we could load a nuclear power plant with uranium at \$35 a pound and operate the plant until all the uranium was consumed, we should produce 2.7 million kilowatt-hours of electric energy for each pound of uranium initially charged, with a fuel cost of .013 mill per kilowatt-hour. Even ten times this fuel cost would be negligible compared to fuel costs of about 3.0 mills per kilowatt-hour for coal-fired thermal electric plants in this country. If these low fuel costs can be achieved, the cost of energy from future nuclear plants

will be determined almost entirely by the fixed charges on capital investment in plant and equipment.

What are the technical problems involved in the utilization of nuclear fuel, and what sort of costs may we expect in practice?

Only one part in 140 of a natural uranium fuel element is fissionable. This is the isotope U-235. The other 139 parts consist of U-238, which is not fissionable. Fortunately, however, some of the neutrons that are released by the fission of U-235 can be utilized to convert some of the U-238 into plutonium, which, like U-235, is fissionable and can be used as a nuclear fuel. Thus, it is technically and practically feasible to *regenerate* nuclear fuel as it is consumed.

How much is regenerated compared to the amount consumed is determined by the design of the nuclear reactor. It is not technically difficult to regenerate say 0.8 as much new nuclear fuel as is consumed. Obtaining high regeneration factors becomes more difficult since greater and greater care must be taken in utilizing the neutrons. However, it is possible, as has been demonstrated recently, to regenerate more nuclear fuel than the amount consumed—in other words, to have a regeneration factor greater than 1.0.⁴ In this case the reactor is called a “breeder,” since it produces more fuel than it consumes, and essentially adds to the world’s supply of fissionable material.

Theoretically, therefore, the process of regeneration of fuel in a nuclear power plant can lead to substantial, and in some reactor designs to complete, utilization of the original uranium fuel. For example, in a plant with a regenera-

² It should be noted that this price is arbitrarily established, since the AEC is the only customer for uranium in this country. In a free market the price might be less. For further analysis of this item see Karl Cohen, “The Key to Atomic Power,” *Nucleonics*, Vol. 11, No. 5 (May 1953), pp. 10-13.

³ W. H. Zinn, “Basic Problems in Central Station Nuclear Power,” *Nucleonics*, Vol. 10, No. 9 (Sept. 1952), pp. 8-14.

⁴ Remarks by Gordon Dean, chairman of the Atomic Energy Commission, at the twenty-first annual meeting of the Edison Electric Institute, Atlantic City, New Jersey, June 4, 1953.

TABLE 5—FUEL CONSUMPTION VERSUS REGENERATION

Regenerative Efficiency	Fraction of Uranium Consumed
0.7	0.023
0.8	0.035
0.84	0.044
0.94	0.12
0.95	0.14
0.98	0.35
0.99	0.7
0.993	1.0

Source: E. C. Miller, "Zirconium: A Structural Material for Nuclear Reactors," *Nucleonics*, Vol. 11, No. 7 (July 1953), p. 28.

tion factor of 0.8, 3.5 per cent of the total uranium could, in principle, be utilized.⁵ Table 5 indicates the fraction of fuel utilization that can theoretically be achieved as the regeneration factor is increased toward unity.

In practice we are faced with major difficulties which now prevent us from realizing the potential costlessness of nuclear fuel. As mentioned above, the technical problems increase as one attempts to push the regenerative factor to allow greater utilization of the fuel. Moreover, even with high regenerative factors, there are three major technical limitations which now require that fuel elements be discharged from the reactor after only a small fraction has been utilized.

The first limitation, which applies particularly to plants with relatively low regeneration factors, is the fact that as the fuel is consumed a point will be reached at which there is not enough fissionable material left to make the reactor critical, and the plant will automatically shut down.

The second limitation is the fact that as the fuel is consumed it produces fission products and other isotopes which, if allowed to remain in the fuel, poison the chain reaction and cause the plant to shut down.

⁵ $0.7\% [(0.8) + (0.8)^2 + (0.8)^3 + \dots] = 0.7\%/1-0.8 = 3.5\%$.

The third limiting factor is that metallic uranium fuel elements suffer structural damage as a result of the severe radiation effects to which they are subjected while in a reactor. This damage is made evident by pronounced physical distortion of the elements, which, beyond a certain amount, cannot be tolerated for continued safe operation of the plant.

Because of these effects, singly or in combination, currently developed types of fuel elements must be discharged before an appreciable fraction of the energy that is potentially available has been utilized.

THE "ONCE-THROUGH" OPERATION

What may we expect to achieve in practice in the way of fuel costs? First let us assume that a nuclear power plant having a regenerative factor of 0.8 could be designed and operated within the next few years. The fuel would have a potential maximum utilization of 3.5 per cent, or 95,000 kilowatt-hours of electric energy per pound. However, because of the chemical and physical changes in the fuel elements, perhaps only the order of 0.5 per cent, or 13,500 kilowatt-hours, could be utilized before the fuel would have to be replaced. In this case the fuel, at \$35 per pound, would contribute 2.6 mills to the cost of production of one kilowatt-hour. Thus, even this relatively inefficient type of nuclear power plant operation would provide a fuel cost comparable to conventional fuel costs.

The type of plant which would operate in this fashion has been referred to as a "once through" plant, since the fuel is not recycled.⁶ Although there are at present technical hindrances to realizing even this efficiency of operation, of all the types of plants, this one holds most

⁶ Partially utilized discharged fuel would of course be stored for later use in plants having improved utilization characteristics.

promise for achieving useful and economic nuclear power at the earliest date. By concentrating on technical developments which would allow increased fuel utilization before discharging became necessary, low fuel costs could be achieved. Table 6 shows how fuel costs contribute to the cost of electric energy for different percentages of utilization per cycle.

The once-through operation has one big disadvantage. That is that only a small fraction, say 1 or 2 per cent at the most, of the raw material can be utilized. There would be no objection to this if raw materials were unlimited. However, this is not the situation. Raw materials are limited, particularly in the case of the high-grade ores which provide the cheapest fuel. An attempt to expand a nuclear power industry on the basis of once-through reactors would reach a stage at which rising raw material costs would increase fuel costs beyond the point of economical operation. The once-through type of plant, as well as offering the first possibility of producing competitive nuclear power, may have a continuing but limited role to play in a nuclear power industry. However, if nuclear energy is to be a significant factor in meeting the world's fu-

ture energy requirements, then we must find an economical way of utilizing a major fraction, if not all, of the resources of nuclear fuel.

RECYCLING OF FUEL

Recycling the discharged fuel elements would be the next logical step in the direction of improving utilization of raw materials and maintaining low fuel costs. Thus, the fuel discharged from a plant with a regenerative factor equal to 0.8 after only 1 per cent utilization could be recycled after certain reconditioning. This reconditioning would involve chemical processing to remove objectionable fission products, and refabrication of the fuel into a form ready for recharging into the plant. In addition, fresh fuel would have to be provided to make up for consumption of fissionable material. Assuming that material rejected from the reprocessing plants contains negligible amounts of fissionable material, the fuel make-up would amount to 30 per cent of once-through requirements.

Handling of the discharged fuel is complicated by its intense radioactivity. Because the information is classified, it is not possible to quote a unit cost for the reprocessing of fuel, but for the pur-

TABLE 6—CONTRIBUTION OF NUCLEAR FUEL COST TO COST OF ENERGY FOR DIFFERENT VALUES OF PER CENT FUEL UTILIZATION PER CYCLE ^a

Fuel Cost per Pound	Energy Cost (Mills per kilowatt-hour)				
	0.1 per cent utilization (2,700 kwh /lb)	0.5 per cent utilization (13,500 kwh /lb)	1 per cent utilization (27,000 kwh /lb)	2 per cent utilization (54,000 kwh./lb.)	10 per cent utilization (270,000 kwh./lb)
\$10	3.7	.7	.4	.2	.04
\$20	7.4	1.5	.7	4	.07
\$30	11.1	2.2	1.1	6	.1
\$40	14.8	3.0	1.5	.7	.15
\$50	18.5	3.7	1.9	.9	.19
\$75	27.8	5.6	2.8	1.4	.28
\$100	37.0	7.4	3.7	1.9	.37

^a 2.7 million kilowatt-hours of energy per pound of uranium for 100 per cent utilization (25 per cent thermal efficiency assumed).

TABLE 7—ANNUAL URANIUM REQUIREMENTS FOR DIFFERENT VALUES OF PER CENT UTILIZATION AND FOR DIFFERENT ANNUAL ENERGY DEMANDS ^a

Maximum Uranium Utilization (Per Cent)	Kilowatt-Hours per ton of Uranium ^b	Uranium Requirements (Short tons per year)			
		10 ⁹ kwh./yr. (125,000 kw) ^c	10 ¹⁰ kwh./yr. (1,250,000 kw) ^c	10 ¹¹ kwh./yr. (12,500,000 kw) ^c	10 ¹² kwh./yr. (125,000,000 kw) ^c
100	5.5×10^9	.18	1.8	18	180
10	5.5×10^8	1.8	18	180	1,800
.1	5.5×10^7	18	180	1,800	18,000
0.5	2.75×10^7	36	360	3,600	36,000
0.1	5.5×10^6	180	1,800	18,000	180,000
0.05	2.75×10^6	360	3,600	36,000	360,000

^a The uranium requirements shown in the table do not include plant inventory requirements.

^b Thermal efficiency of 25 per cent assumed.

^c Equivalent electric generating capacity, assuming a plant capacity factor of 0.80.

pose of this discussion it is only necessary to point out that the cost, including fixed charges on necessary plant and equipment, is substantial. An upper limit to the reprocessing cost per pound of fuel that can be tolerated for a given fuel cost per kilowatt-hour is given by the difference between the cost of make-up fuel per cycle and the cost of fresh fuel for once-through operation. For example, if fresh fuel elements cost \$35 per pound, and make-up per cycle amounts to 30 per cent, then one could afford to pay \$24.50 per pound for chemical reprocessing and refabrication.

The recycling of fuel can, at most, reduce raw material requirements to an extent determined by the regeneration factor of the nuclear power plants. For example, if the industry is based on plants having a regeneration factor of 0.8 and a utilization of 1 per cent per pass, then annual raw material requirements per plant may be a third as much compared to requirements for once-through plants. When energy demands grow, without a corresponding increase in raw materials at economic prices, the need for improved material utilization will have to be met by the development and use of plants having higher regen-

eration factors. The actual operating fuel costs will not be reduced unless the processing costs per cycle are reduced and/or the percentage of energy utilization per cycle is increased. Table 7 shows the annual uranium requirements for different values of per cent utilization and for different annual energy demands. It may be noted that the total production of electric energy by steam plants in the United States during 1951 amounted to 2.6×10^{11} kilowatt-hours.⁷ Moreover, production is expanding at a rate that doubles capacity every ten years.⁸

An appreciation for the potential significance of uranium as a source of energy can be obtained by comparing the requirements shown in Table 7 with recent unofficial estimates of 1,000 tons per year for current rate of production and 25 million tons of recoverable reserves in the world.⁹

⁷ P. W. Swain, "1952 Modern Plant Survey," *Power*, Vol. 96, No. 3 (May 1952), p. 97

⁸ *Resources for Freedom*, A Report to the President by the President's Materials Policy Commission (Washington: Government Printing Office, 1952), Vol. I, p. 103

⁹ Karl Cohen, *op. cit.* note 2 *supra*. Recoverable uranium is defined as that which is obtainable at \$100 per pound or less for metal

VALUE OF BREEDER PLANTS

The limit to utilization of recoverable raw materials is reached when plants have been developed with a regeneration factor essentially equal to unity.¹⁰ At this point, the electric power generating capability of a nuclear power industry can be expanded only if more fissionable material can be produced than is consumed. This is the significant role that the breeder plant can play in the growth of an industry. It promises a solution to the problem of meeting growing energy requirements when all economically available raw materials have been mined. It does not promise more total energy from the same raw materials than could be obtained by plants having regeneration factors equal to unity, nor does it promise cheaper energy, since the basic elements of fuel cost, percentage of utilization, and cost of reprocessing per cycle will still be present. The development of efficient breeder plants will allow us to burn up our nuclear fuel resources faster to meet large annual energy requirements.

The development of efficient breeders will place a premium on achieving high fuel utilization per cycle and low fuel reprocessing costs. The reprocessing problem is rendered more acute since small materials losses, which would be multiplied by the number of cycles required for complete consumption of the

in billets. By the same definition, the world's thorium reserves are estimated to amount to 1 million tons. Palmer C. Putnam, *Energy in the Future*, New York: D. Van Nostrand Co., Inc., forthcoming in 1953. Analogous to the production of plutonium from uranium 238, thorium can be utilized to produce the fissionable material uranium 233. Although the discussion in this paper has referred specifically to the use of uranium, most of the economic aspects apply equally well to the use of thorium in nuclear power plants.

¹⁰ It is assumed here that material losses during reprocessing are negligible.

fuel, can seriously affect the breeding factor. Although little can be said at this time with regard to either the plant investment or the fuel costs for breeder-type plants, there is no reason to believe that the major problems cannot be solved to provide competitive nuclear power from such breeder plants.

DISPOSAL AND OPERATING COSTS

The large-scale production of nuclear power, by regenerative and/or breeder plants, will create a serious problem associated with the disposal of radioactive wastes, principally fission products, from fuel reprocessing plants. The cost of safe disposal operations, which may be significant, must be included in the over-all fuel cost charged to the production of energy. However, the development of large-scale by-product uses for these fission products in industrial operations is not out of the question. Such uses might provide a net revenue, which could be applied to reduce the production cost per kilowatt-hour of energy.

In concluding the comparison of energy costs from nuclear power plants and conventional plants, there is one common element left to be discussed. This is the cost of operating, maintaining, and providing supervision and administrative management for the plant. Qualitatively, one would expect that this item would be relatively more costly for a nuclear plant because of the necessary activities related to security and health in addition to the activities common to both types of plants. In fact, it may be a real problem to keep the operating costs of a nuclear power plant down to the value achieved in conventional plants, of about one mill or less per kilowatt-hour.

In summary, the above comparison of power costs emphasizes the present large uncertainties inherent in any estimate of nuclear power plant performance.

Without realistic information on the cost of raw materials, the cost of fabricating fuel elements, the depreciation rate of nuclear plants, and the per cent utilization of fuel elements, one can place no confidence in paper estimates of the over-all unit energy costs. This discussion has attempted to indicate that the cost of nuclear power from single purpose plants would be considerably higher today than conventional power costs in this country. On the other hand, when one examines the power situation outside of this country, the economic feasibility of single purpose nuclear power plants appears much more promising for the immediate future. A recent survey of possible foreign markets for reactor power plants indicates that there are areas in the world where plants to supply 5,000 to 50,000 kilowatts of electric power "in the cost range from 25 to 40 mills per kilowatt-hour could be competitive with existing power supplies or could supply needed power that does not exist now."¹¹

PROGRAM FOR THE FUTURE

The discussion has pointed out that there are no technical reasons that would lead one to question that the cost of nuclear power can ultimately be lowered to the point of being competitive with and perhaps even significantly cheaper than conventional power costs in this country. This objective will not be easily or rapidly obtained. Its achievement will require a costly development program, concentrating on five major technical objectives: (1) designing of reliable, safe, and long-lived plants at low costs per kilowatt of generating capacity; (2) development of inexpensive processes for the recovery

of source materials from low-grade ores; (3) development of inexpensive fuels that can provide a relatively high percentage of utilization before they must be replaced; (4) development of inexpensive chemical processes for the recovery and re-use of discharged partially utilized fuel; and (5) development of inexpensive and safe methods of radioactive waste disposal, including revenue-producing by-product uses.

Much can be done in moving toward these technical objectives by an extensive program of component research and development. However, the over-all technical performance and economic feasibility of nuclear power plants can be realistically appraised only by actual experience with operating prototype plants. Only by building single purpose plants can imaginative engineering be stimulated to reduce capital costs. It is much more likely that these costs will be reduced by the application of many relatively small design improvements which cumulatively can provide large savings than by the application of a few sensational ideas.¹²

In view of the very questionable current economic feasibility of single purpose nuclear power plants in this country, support of a program to construct one or more prototype plants must come from public and/or private groups that are concerned with promoting our national interests, both long-term as related to our own economic and industrial development and short-term as related to the part we can play in strengthening the economic welfare of friendly nations. These groups include govern-

¹¹ Howard C. Gary, "Foreign Market for 'Package' Nuclear Power," *Nucleonics*, Vol. 11, No. 5 (May 1953), pp. 14-15.

¹² George L. Weil, "A Prospectus for Development of Atomic Power Through a Single Purpose Experimental Industrial Reactor (SPEIR)," privately printed, September 1952. Reproduced in Joint Committee Print "Atomic Power and Private Enterprise," Appendix A, Washington: Government Printing Office, December 1952.

ment agencies and private nonprofit organizations.¹⁸

Whether the government undertakes a program wholly with public funds or whether private funds are involved, it seems that our national interests would be best served by a program that would

concentrate on the technical and engineering problems that must be solved if the full potential economic benefits of nuclear power are to be realized. Only by establishing a program with the single purpose of determining how cheaply we can produce power from nuclear plants shall we be able to evaluate the uses of nuclear power for peaceful purposes and to obtain benefits from these uses in the near future.

¹⁸ George L. Weil, "A Role for Private Non-profit Organizations," *Bulletin of the Atomic Scientists*, Vol 9, No 5 (June 1953), pp. 165-68.

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Some Economic Consequences of Nuclear Power

By WALTER ISARD and ROBERT A. KAVESH

AN examination of the engineering and industrial literature on nuclear power development during the last year or two discloses a new mood of optimism among those concerned with this subject. According to a number of informed scientists and observers, power produced from either dual or single purpose reactors seems to be within the margin of economic feasibility.

Whether or not the government implicitly or explicitly subsidizes the production of power, by purchasing fissionable materials, by underwriting or directly assuming construction costs of nuclear installations, or by other methods, these persons contend that nuclear power can be produced within the relatively near future at a cost which would be competitive with power produced in the higher cost areas of the United States and other parts of the world. Further, it is held that, as sources of fossil fuels become more and more exhausted, the competitive standing of nuclear power is likely to improve markedly. And, finally, there are those who visualize in the far future major technological developments in nuclear engineering and hence significant reductions in the cost of nuclear power.

Although available information does not lend any support to this last and most optimistic outlook, it is useful to examine what the implications of nuclear power might be if it were to develop generally as a cheaper source of power. At the least, such an analysis will provide some insight into the benefits from the use of nuclear power for domestic and foreign areas where high power costs prevail and where reduction of power costs incident to nuclear development may be in the offing.

IMPACT ON INDUSTRIAL LOCATION

An indication of the importance of power in industrial production in the United States is furnished by the ratio of fuel and purchased energy to value added by manufacture. At no time within the past fifty years has the ratio exceeded 7 per cent (in 1909); by 1939 it had fallen to 5 per cent and by 1947 to 4.5 per cent. Clearly, any marked decline in power costs does not signify large direct savings in production outlays. However, the major effects of innovations on output are not direct, but indirect. Cost savings in one industrial sector are passed on to other sectors and in turn are reflected back to the initiating sector and again recirculated in continuing round fashion, although with dampened force. Unfortunately, current techniques of economic analysis have not been able to assess and anticipate resulting increases in productivity and per capita output. However, it is possible to analyze the differential effects that cheap, ubiquitous power has on industrial location; and to that manageable area we now turn.

In general, industries may be classified into a few broad, overlapping groups, when dependence upon power is the identifying criterion. Without doubt, nuclear energy would be of little consequence in the location of industries such as leather, tobacco, and numerous steel fabricating activities, which are minor power users. Another group comprises industries which may consume fairly large amounts of power, but whose locations are determined almost unequivocally by other factors.

Examples of this group are pulp and paper mills, dependent upon power to a

marked extent but located near forest sites because of the need to reduce weight and bulk at the material source in order to keep shipping costs within reasonable limits; cement factories, which locate centrally with respect to markets and raw materials, again to ensure low transport costs; and manufactured ice, which is market oriented in light of the perishability of the product and its consequent prohibitive transport costs in relation to value.

These industries—minor users of power and strongly material, market, or otherwise oriented (except to power)—would appear to be affected inconsequentially by the availability of cheap nuclear power.

Aluminum and similar industries

Another group to be considered is that in which power is a prime locational determinant. Aluminum production is perhaps the best illustration of this class. Its locational structure is split into three parts. The conversion into alumina of bauxite ore, which is supplied to the United States chiefly from Dutch Guiana and the West Indies, entails a weight loss while at the same time requiring considerable amounts of heat. The alumina then is electrolytically reduced into aluminum ingots, a process which requires 18,000 to 22,000 kilowatt-hours of electric power per ton of aluminum ingot.

It can be demonstrated that the saving in outlays on power achieved by locating the reduction works at a cheap power site—even one so remote from the New York City market as the Pacific Northwest—more than balances the additional transport costs involved when the various raw materials are not shipped directly to the final market for ingots (such as New York City) but take the long, roundabout route via the Pacific Northwest. Hence, it is not surprising to find that, aside from the relatively small amount of activity based on

domestic ores, the weight-losing bauxite is converted into alumina at Gulf Coast ports (Mobile and Baton Rouge), which, on the routes to such cheap power areas as the Pacific Northwest and the Tennessee Valley, are the points in the United States closest to the sources of the bauxite ore.

At the same time, these Gulf ports have access to cheap natural gas via pipeline. Once produced, the alumina is for the most part shipped to, and converted into aluminum ingot in, the Pacific Northwest, the Tennessee Valley, Texas, and northern New York State. And, finally, the aluminum ingot is transported to various aluminum fabricators which are located at the market points for the finished aluminum products. These fabricators are located at the market points rather than at the reduction sites because it is less expensive to transport one ton of aluminum ingot, which is charged a relatively low freight rate, than an equal or greater tonnage of finished products, with their high rates.

Given this roundabout pattern of shipments, and given cheap, ubiquitous nuclear power, is it reasonable to believe that the bauxite could be moved directly to the major markets, and that an integrated operation using nuclear power as a source of both heat and power would take the place of the geographically split production process?

Clearly, in such a situation large savings in transport costs could be achieved. However, the answer to our question tends to be negative. Even if the kilowatt-hour cost of nuclear power were to fall to the very low level of four mills (a level which represents a very high degree of optimism with respect to future technology), it can be shown that it would still be more economical to adhere to a split pattern of location in order to obtain hydropower at about two mills per kilowatt-hour. Hence we

may conclude that cheap nuclear power is not likely to affect the location of existing aluminum capacity.

But, to the extent that cheap hydroelectric sources, such as the Pacific Northwest, become fully utilized in the future, and to the extent that high-cost power sites—three- to four-mill sites—must be used, the possibility of locating new aluminum capacity at major market sites such as Chicago and New York, granted the existence of nuclear power at four mills, becomes real.

Thus we conclude that for activities highly sensitive to cheap power—particularly the electroprocesses such as aluminum—existing and future capacity will remain at or seek the cheap hydro sites while they are available. These activities will not be pulled by cheap nuclear power until the sources of cheap hydropower become exhausted.

The glass type

Still another group of industries can be identified, which are not so sensitive to cheap fuel and power as aluminum. Though the orientation of these industries is to fuel and power sources, it is only within a framework in which other locational factors are almost as important. The glass industry is a good illustration. Natural gas is used extensively in the production of glass. In fact, the tie between natural gas and glass has been so close that historically the industry has moved from one gas site to another for adequate supplies. The location orientation, however, is not entirely one of fuel. Transport costs on raw materials and finished products are high, and there are indications that if cheap fuel and power, such as four-mill nuclear power, were made available at major market sites, new glass capacity would tend to locate there.

It is this type of industry, and not the type extremely sensitive to cheap power, that, paradoxically enough, is

likely to be most affected by nuclear power in the near future.

In general, we foresee no drastic relocations of industry, no decentralization or breaking up of existing industrial concentrations or metropolitan centers within the United States.

SOME CRITICAL CONSIDERATIONS FOR UNDERDEVELOPED ECONOMIES

This tempered outlook on the probable effects of the introduction of nuclear power in the United States might be reconsidered with respect to development within foreign nations. Several basically new factors are pertinent. Capital costs involved in the construction of a nuclear power plant will exceed those of an efficient steam (or hydroelectric) plant. This is necessarily so because in the nuclear plant the reactor and chemical and metallurgical facilities substitute for the boiler of the standard steam plant, whereas the conventional turbines and generators are retained.

Increased capital costs in turn signify increased interest charges, whether these charges are actually paid or subtly subsidized by government underwriting or investment. Coupled with this is a world-wide pattern of interest rates in which low rates characterize the United States, Great Britain, and other heavily industrialized areas, and high rates prevail in underdeveloped areas such as Latin America and parts of Asia and Africa. As a consequence, underdeveloped areas, with high interest rates, must labor at a great cost disadvantage relative to developed areas in the production of nuclear power. To be specific, if an area such as Canada must pay 5 per cent for capital, whereas Egypt must pay 10 per cent, this *alone* would tend to make the cost of nuclear power in Egypt approximately four mills greater.

Such a significant obstacle for the underdeveloped areas in a competitive

trading world, together with the lack of skilled personnel and complementing industrial facilities, casts a good deal of skepticism upon grandiose ideas for a nuclear powered industrialization of these economies.

Still another factor to be considered in assaying the probable impacts of nuclear power on underdeveloped nations is that of economies of scale. Indications are that nuclear power plants will be most efficient at high capacities. Average unit costs will continue to decline at larger capacities for nuclear power plants than for steam plants. For steam these economies are currently not significant beyond 75,000 to 100,000 kilowatt capacity. In contrast, for nuclear reactors certain types of equipment and facilities will be so invariant with size of station that economies of scale may still be realized up to capacities of 500,000 kilowatts.

The above consideration means that costs per kilowatt-hour will be lower for giant plants than for small. Yet those nations that are capable of absorbing the output of these larger plants and thus realizing these economies of scale are the more highly industrialized ones. And finally, when it is recognized that nuclear power development requires some previous subsidy through pilot atomic energy plants and experimentation at government expense, which only the industrialized nations can afford and which are in essence capital subsidies, the outlook for such development in the less industrialized nations must be seriously qualified.

In sum, any statements about the equalizing effects of nuclear power upon resources at the command of the industrialized and underdeveloped nations and upon their economic potentials must be viewed with considerable restraint. Capital costs, interest rates, demand conditions, and subsidy requirements—as well as various cultural factors—do not add up to a very optimistic outlook

for the economic utilization of nuclear power in these underdeveloped nations.

SOME ECONOMIC ASPECTS OF POLICY QUESTIONS

With these considerations as background, it is also interesting to inquire into certain implications for policy decisions. Limited space permits us to illustrate only one possible area in which decisions may have to be made. But it is clear that the kind of analysis involved in making these decisions will in general characterize the type required for the various economic evaluation problems which will confront the Atomic Energy Commission and the Congress. Since in the recent discussions of economic feasibility most attention has been focused on the dual purpose reactor, we shall base our illustration upon aspects of its operation. Nevertheless, what we have to say has bearing for decisions on other types of reactors.

Suppose cumulated experience leads to the conclusion that nuclear power in fact cannot compete with conventional power. At the same time let it be decided that for military and political reasons atomic energy installations should be kept in operation in order to maintain capacity to produce fissionable materials. Such a situation necessitates that part of the costs of nuclear power shall be borne by the military. Generally speaking, the Congress and the people of the United States are interested in maintaining such capacity in operation at the lowest cost to the taxpayers. A priori, it would seem that a decision should be made to locate such capacity in areas where high power costs, and hence revenues, obtain, such as Puerto Rico and New England. It may be reasoned that the higher the revenue from power sales, the less cost the government or military would have to incur for the operation of the atomic energy establishment.

This a priori reasoning, however, must be qualified. It is necessary to consider the ability of an area to absorb the output of power from any atomic energy installation. Even though a high price for power exists in an area, additional output of power may be absorbed only by considerable reduction in the power charge, with the result that total revenue will not be so great as initially anticipated. Another area where the current price for power is not so high may be better suited for such an atomic energy installation, because it can easily absorb the additional power at the going price.

Thus far the analysis places a premium on high power cost areas in which simultaneously the demand for power is increasing rapidly—conditions which, for example, tend to characterize Puerto Rico, but not New England. The policy question, however, is still more involved. New England is a high power cost area. Its consumption of power is not growing as rapidly as that in other regions. Too, its economy is forging ahead more slowly than that of most other regions in the United States. At the same time, the establishment of an atomic energy works which produced power to be sold at a rate below the prevailing high charges, would have a stimulating effect on the industrial development of New England.

It can thus be argued that the construction of nuclear energy installations in a region such as New England is one way of attacking its unemployment problem and the associated high social costs. It can also be viewed as a means

for counterbalancing exodus of industry, particularly textiles. And by those persons who contend that New England does not receive a fair share of public works construction, it may be considered as a way of rectifying the imbalance between federal expenditures in New England and federal receipts from New England. In these lines of reasoning, maximizing power revenue is only a secondary issue when compared with reaping the benefits to be achieved through influencing the course of industrial development.

Other individuals, from different regions or with different sectional interests, may agree with the contention that power revenue ought to be a secondary consideration; but in contrast with the New Englanders, they will point to the low per capita incomes of the South and Puerto Rico, and argue for using atomic energy installations as a means to equalize per capita incomes through fostering industrial growth in poor areas. When the question of choosing among several low per capita regions is posed, unfortunately we have no solution to the benefit-cost problem which arises.

In short, we have sketched some of the numerous and perplexing considerations that face an authority in underwriting or subsidizing a nuclear power development, which may be of such a magnitude as significantly to affect regional economic welfare. The answer to some of the policy questions which will confront the government cannot be simple, and will require all the analytical acumen and intuition of social scientists and administrators.

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Some Sociological Consequences of Atomic Power

By VINCENT HEATH WHITNEY

FUNDAMENTALLY, the sociological study of atomic power is only a special case of the sociological study of innovation. The history of any one novel idea has, of course, no determinative value so far as any other new configuration of ideas goes. There are nevertheless some general principles of innovation, based on an analysis of innovation as a mental process and on consideration of the experience of prior inventions among diverse social groups.¹ The application of certain of these principles to atomic power can serve two purposes. First, it can replace the aura of mystery and glamour which in the last few years has too frequently substituted for a more rigorous frame of analysis. Second, it can prevent the kind of unwarranted speculations about the far-reaching changes in social organization which are likely to be logical derivations of any consideration of nuclear development based principally on unbridled imagination and wishful thinking.

INNOVATIONS AS IDEAS

Atomic power is ordinarily conceived of in terms of the physical components in its production. It is not only correct but necessary to understand the requirements in terms of raw materials, generating and auxiliary facilities, and so on, in coping with problems of nuclear development and in attempting to assess future consequences. It is also neces-

sary to see that, like all other innovations, atomic power represents a novel configuration of ideas. If we assume that technical problems are adequately solved, the use of atomic power in a specific industry or area, or by a given group of people, becomes a function of the two variables of demand and resistance, which are also mental phenomena.

Viewed at this level, it is clear that any innovation may produce one of three results when it is introduced, either by local invention or by diffusion, into the context of an existing social order. It may be generally viewed as harmonious with established culture patterns and value systems, and encouraged, provided it is feasible and functions as an acceptable means to a positively valued goal. It may be interpreted as incompatible, and be actively discouraged where a conflict of ideas occurs. It may be viewed with indifference and fail to become established, through the passive resistance implied in lack of demand.

THE CULTURAL SETTING

It is true, as many have pointed out, that both the technical knowledge and the fissionable material necessary to operate a nuclear generating station are theoretically transportable anywhere. The same is not true of value systems and of cultures. The complex structure of beliefs and institutional practices of one people may be favorable to change in general and to technological innovation in particular. The social, cultural, and psychological milieu may thus be suitable for the introduction of atomic power. It is certain, however, that op-

¹ Among others, see H. G. Barnett, *Innovation: The Basis of Cultural Change*, New York: McGraw-Hill Book Co., 1953; S. C. Gilfillan, *The Sociology of Invention*, Chicago: Follett Publishing Co., 1935; and Hornell Hart, *The Technique of Social Progress*, New York: Henry Holt and Co., 1931.

posite and unfavorable conditions will exist among other peoples and in other areas, and that there is nothing inherent in atomic power which will in itself alter these arrangements.

Like any novelty, atomic power can be developed only in the context of some social organization. This means that established procedures exist which have the sanction and force of the customary—and therefore right—way to meet a specific situation. Every culture is composed of interdependent parts. Thus, the introduction of something new always involves some degree of strain and loss. This is why an innovation must be positively wanted by enough people, or by persons with the necessary authority or prestige, if it is to be accepted.

Even the absolute desirability of an innovation is not likely to be the overriding consideration in determining its use or rejection. Rather, it is the desirability of atomic power, or of any other innovation, *relative* to the losses involved in its acceptance. This helps to explain why the assumed benefits of a new energy source are not always apparent to another people. Some consequent degree of industrialization or urbanization may be viewed not as productive of a rise in material standards of living, but simply as a threat to a customary and positively valued way of life. In short, the initial premise, widely held in the United States and other industrialized nations, that atomic power will be "good" is by no means universally accepted.

INDUSTRIALIZED AREAS

In westernized countries, the long process of the industrial revolution has led both to a general acceptance of the usualness of change and to a specific willingness to promote and to utilize technological developments. In coun-

tries like the United States, people encounter a steady stream of competing ideas and values; therefore, paradoxically, the unfamiliar is not necessarily the strange. Moreover, the strong emphasis upon getting ahead individually and raising living standards nationally favors acceptance of innovations similar to those which have played a part in these processes in the past. Clearly, in these countries atomic power provides the identification with previous experience which is essential if assimilation of a novelty into the social organization is to occur.

As an innovation, atomic power is quite unlike the new style of dress, or birth control, or the ideology of brotherhood, which, in the last analysis, individuals either adopt or do not adopt as parts of their unique life organization. The development of atomic power has necessarily been largely a government monopoly everywhere, and for some time can be expected to involve at most a limited number of private enterprisers. The latter will need both government blessing and some form of subsidy, whether outright or disguised in such forms as continuing government research laboratories or prices for plutonium high enough to make the private sale of nuclear-based power competitive. The vast majority of individuals will simply continue to buy electricity for household and industrial uses, whether it is generated in conventional or in atomic stations. In this sense they can hardly be said to have to face the question of acceptance or rejection of atomic power at all. Certainly, their lives will not be immediately affected whether atomic power is introduced or not.

There is, however, a marked and very real difference between the consequences of atomic power use for the relations of individuals in the already industrialized countries and in those which are eco-

nomically underdeveloped. In the former regions, atomic power can be a useful adjunct to continuing industrial growth, but there is no evidence that it will alter the nature of the daily routine for the majority of persons. Its most noticeable effect here may be simply to increase the concentration of industrialization already apparent,² and, in doing so, to intensify urban-industrial life orientations for the people of such areas.

UNDERDEVELOPED AREAS

In underdeveloped regions the expectation is quite different. Outside of a few specialized projects, it is hard to conceive of any extensive use of atomic power in such areas except as part of an expanding market for power in transportation and industry. This in turn implies population aggregation as part of the development of a concentration of facilities for production. Culturally, this suggests an orientation quite at variance with what is actually found today over much of the globe. Each area is, of course, unique in many ways, and meaningful studies must derive from a detailed analysis of empirical situations rather than from arbitrary classification schemes. Nevertheless, the existing data allow the generalization that economically "advanced" and "underdeveloped" societies are not to be equated either in terms of their willingness (as distinct from their ability) to utilize atomic power or in terms of the consequences for each, of such use.

In the underdeveloped regions, we find resistances to nuclear development not only in such concrete factors as lack of capital, transport facilities, cheap fuel, trained technical personnel, and so

on, but more broadly in the economic imbalance and lack of integration, the Malthusian populations, the unstable political organization, the low levels of living, the educational poverty, and the well-entrenched sets of customs and values which are either indifferent or actively hostile to the changes implied by economic development.³

In these areas the mass of individuals are indifferent to atomic power because it has no reference to their experience—if, indeed, they know of it at all. Acceptance in such cases really means the prior acceptance of urbanization, of industrial employment, of the changed fabric of social customs and human relations inherent in continuing economic development. If revolutionary change of this kind occurs, atomic power will be theoretically acceptable as an assimilable component of the new configuration.

In such regions the relatively small elite, who hold interlocking positions of social, political, and economic dominance, are likely to understand that economic development can prove a threat to the special privilege they derive from carefully established positions. Change demands readjustment, and the outcome is never wholly predictable. The colonial area is a special case, in the sense that changes which are not actively desired locally may be imposed from without to some extent.

³ See, for example, Vera Anstey, *The Economic Development of India* (London: Longmans, Green, and Co., 1952), fourth edition. Dr. Anstey notes: "... certain religious ideas and conventions, and the rigid social stratification and conservatism based upon those ideas and conventions, still pervade every sphere of life, and limit economic development at every step" (p. 471). Among others, cf. Olen E. Leonard, *Bolivia: Land, People and Institutions*, Washington: The Scarecrow Press, 1952; T. Lynn Smith, *Brazil: People and Institutions*, Baton Rouge: Louisiana State University Press, 1946; and Nathan L. Whetten,

² For the reasoning behind this statement, see Walter Isard and Vincent Whitney, *Atomic Power: An Economic and Social Analysis* (New York: Blakiston Co., 1952), Part II.

Even in the industrialized nations, the heads of major companies, which may have the technical competence to assist in the development of atomic power facilities, must consider against the possibility of being "left out" in a new field the hard facts of heavy investment in conventional power plants and equipment and, especially in the United States, the general adequacy of present power sources, particularly in relation to the rather firmly established pattern of industrial and population distribution. If there is a period of additional declining employment, power production may become overproduction, further decreasing income. There are also the resistances in terms of relative power cost, size of market, industrial location, and so on (discussed by Dr. Isard in another article), and the impelling factor of subsidization by government for a variety of reasons concerned with war as well as with peace. Limited space prevents further consideration of these.

Generalized discussions of the use of atomic power and of the consequences of such use are meaningless. It will bear repetition to stress that atomic power can never be introduced into a vacuum, and that consequently it can be fruitfully studied only in the context of specific and intricate social organizations. Every people is in some degree unique. For some, atomic power will suggest compatibility and efficiency. For others, it will not.

Summarizing my conclusions elsewhere, it seems likely that atomic power will prove less useful to underdeveloped areas than to those industrialized nations which already have social and economic organizations to which it is fairly readily assimilable. But even here, the strength of resisting and impelling factors will vary from country to country,

with the Soviet Union and Great Britain, for example, likely to press more strongly for atomic power under present conditions than the United States.⁴

SOCIAL ORGANIZATION AND ATOMIC POWER

In discussing atomic power as an innovation, an attempt has already been made to indicate in general terms how the pattern of social organization operates to influence the probability of a specific invention and its subsequent acceptance and use. Here attention will be focused briefly on certain details of the way in which the social organization operates as a permissive or limiting mechanism, and, additionally, on some possible consequences of the introduction of atomic power for social organization. Ideally, this would involve an empirical study of several areas. Since this is impossible in the space available, consideration will be limited to two arbitrary groupings—the urbanized-industrialized nations and the underdeveloped areas where population is primarily oriented to subsistence agriculture.

Manifestly, there are no grounds for considering any pattern of social organization as causative in the adoption of an innovation. On the other hand, given certain cultural arrangements, it is inconceivable that a particular novelty will be created or utilized. Atomic power itself could hardly have been developed in most parts of the world today. Relatively few areas combine a social organization in which complex technological innovation is stressed, with the requisite natural and human resources, the needed capital, and the necessary incentives. The existence of such a combination of factors is, of course, no guarantee of anything. It has no inevitable consequences. But it

Rural Mexico, Chicago: University of Chicago Press, 1948

⁴ For the argument and supporting data, see Isard and Whitney, *op cit.*, ch 9.

does make a particular innovation possible, and, in this sense, may be described as a permissive milieu. A lack of factors compatible with the production or use of a novel idea similarly serves to limit or exclude that idea—whether the latter be democracy or television or atomic power.

RESTRICTIVE SOCIAL ORGANIZATION

Among some one-half to two-thirds of the population of the world today, social organization is of a type I would consider limiting or excluding as far as atomic power goes. Most of Asia, Africa, and South and Central America would fall in this category. It is not that these largely underdeveloped regions lack communication with the rest of the globe, or that they have no people capable of understanding the technical details of nuclear fission or atomic plant operation. It is not merely that they lack capital or other specific economic prerequisites for atomic power production and utilization. More fundamentally, such lacks are symptomatic of the basic demographic and social situation.

This situation varies from country to country. Nevertheless, it can be described for the majority of underdeveloped countries as one in which a subsistence agricultural economy, largely uncontrolled vital rates, and a non-western value system function continuously to maintain one another. Both human and natural resources are employed with marked inefficiency, judged by western standards. Levels of living are low.

Let us for the moment put aside certain very real doubts, and make the assumption that relatively low-cost atomic power can be made available to areas of this description. Exactly what would this mean?

Some have intimated that it would mean the transformation of economi-

cally backward areas into industrial regions which would eventually attain the living standards and way of life of the western world.⁵ The result would be a more uniform economic development of the world's major regions

In view of the multiple economic, political, and social resistances to the widespread use of atomic power, I see no reason to expect that it will in any reasonably near future be employed on anything like a universal scale. If it were, this would, of course, mean that national differentials in access to energy would be diminished. But this is quite different from saying that uniform levels of economic development would be achieved. Access to energy is not at all the same as development and use of these resources. And it is not only possible but, in my judgment, probable that any advantage gained by an increased availability of energy would be negated by the continuing existence among regions of other differentials in human and natural resources.

CULTURAL DIFFERENCES

Let me try to state this another way. It is evident that fundamental differences exist in the ethos of national cultures. In terms of ideal types, an analytically useful distinction can be made between those in which over-all cultural orientation involves a relatively high degree of emphasis on competitive and aggressive behavior patterns directed to the attainment of individualistic ends, and those in which co-operative and nonaggressive behavior patterns dominate and group goals are emphasized. Very roughly, these types can be equated respectively with the industrialized and the nonindustrialized regions of the world. On the personal level the development of the individual

⁵ Cf. P. M. S. Blackett, *Military and Political Consequences of Atomic Energy* (London: Turnstile Press, 1948), ch 8

self involves the internalization of these culture patterns. Consequently, despite the wide variation in individual behavior universally found, attitudes and values, sentiments, roles—in short, a way of life—develop which distinguish any region from any other region.

These diverse orientations make it unrealistic to discuss the impact of nuclear energy except in terms of the expected interaction of the innovation with the multiple factors in the specific social organization under consideration. The introduction of atomic power in India is not the same as its introduction in the United States or in Argentina or even in China. Nevertheless, it may be postulated in general terms that the use of atomic power will tend to be fostered in varying degrees by the behaviors associated with technologically advanced culture patterns, and to be retarded in varying degrees by those typical of the overpopulated and underdeveloped regions. The point to be emphasized is that the introduction of atomic power into the latter types of societies will not ipso facto alter the social organization or remove the hindrances to general economic development which already exist. Unfortunately, nuclear energy has sometimes been confused with magic.

In Brazil, for example, we have a country rich in undeveloped minerals and other natural resources, although deficient in quality coal and developed oil resources. Although Brazil has made some impressive industrial gains in recent years, principally in São Paulo, its resources remain largely unexploited. This lack of development has frequently, and not inaccurately, been attributed to a scarcity of cheap fuel and to inadequately developed power resources. But these are not the only obstacles. The country has been handicapped by niggardly transport resources and markedly insufficient transport facilities, by lack both of capital and of technical per-

sonnel, by labor scarcity and inefficient distribution of population, by poverty, sickness, and illiteracy among the great body of its people, and by a past record of political instability in an unintegrated economy. There is no reason whatsoever to believe that atomic power alone will alter these fundamental conditions. Over time, it could, of course, be one factor among many which would help to do so.

Brazil is now completing a major hydroelectric development on the São Francisco River. It is still true, however, as is the case in many of the underdeveloped areas, that existing and accessible hydropower at first-class sites remains unexploited. India's potential energy resources are largely unrealized. Rhodesia has not achieved any considerable degree of economic advance, despite the presence of the renowned Wankie coal deposits and the vast energy potential of the Zambezi River system. Expansion has been limited by a lack of consumers aside from the railways and the copper mines in the north.

Such conditions suggest that it is an error of first magnitude to ascribe the low ratio of developed power to land area, characteristic of many underdeveloped countries, to a lack of access to energy resources. The fact is that these very areas are quite commonly far from exploiting whatever energy resources they do have. In view of this, it hardly seems probable that the technical availability of another energy source, atomic power, would produce an economic renaissance or revolutionize firmly rooted cultural configurations. The very existence of such undeveloped resources suggests the tenacity of the existing patterns of social organization.

It is not to be denied, of course, that future industrial growth may be more rapid than that which characterized European expansion. The opportunity to profit from past experience and to bor-

row, rather than to initiate and perfect, industrial techniques makes this possible. It will still be true that in an economy based on peasant agriculture, the over-all social organization will tend to be a drag on rapid industrialization, whether it be stimulated by a new energy source or by some other factor.

In short, the crucial problem is that of maintaining a rate of technological growth in excess of the rate of population growth. If this is not done—and whether it can be is a tight argument—the use of atomic power will be restricted not only by lack of growth of markets, but more fundamentally by continuous diversion of potential surplus capital to the support of increased numbers at approximately the same low levels of living. Under such conditions, atomic power cannot serve to spark continuing rounds of economic development or to promote fundamental changes in social structure and values, even with subsidization.

POPULATION AND ECONOMIC DEVELOPMENT

One of the principal reasons for this is the population pattern characteristic of the underdeveloped areas that contain more than half the present population of the world. These are the agricultural areas ordinarily described as "overpopulated," in which any increases in productivity are largely absorbed by increases in numbers, with little or no net gain in levels of living. Because birth and death rates are largely uncontrolled, gradual economic development is not enough to resolve the fundamental problems involved in the pressure of numbers on available resources.

Economic development implies some degree of control over death rates. In comparison with a similar degree of control over birth rates, decreased mortality is easily achieved both because relatively cheap technical means of re-

ducing grossly high rates are available and because these can be applied with little or no interference in the daily life of the people of an area, and without conflict with established customs and values. Illustrations are improved transportation systems, minimizing local famines; the sanitation of the religious centers in India which had served as centers of infection because of the pilgrims who returned to all parts of the country;⁶ or the dusting of an area with a few hundred pounds of DDT, which in Ceylon resulted in a rapid and sharp decline in mortality.

If atomic power is to serve as a stimulus for industrialization in such countries, rapid control over births as well as deaths appears essential. This suggests the pressing need for research into cheap and effective methods of achieving control over births in the face of patterns of social organization which are frequently hostile or indifferent to the spread of family limitation. The problem is less pressing in areas like much of the Middle East or Soviet Siberia or Brazil or other parts of South America which cannot be termed overpopulated. But for the underdeveloped, overpopulated regions, the long process of closing the demographic gap by a gradual change in values as an urban-industrial base slowly develops is apparently unworkable.

The last few paragraphs may seem a digression. Actually, they are essential to demonstrate the unrealistic optimism in the view that an economic revolution will be produced in agrarian economies by the mere availability of atomic power—or even by its actual use on a limited scale, which is hard to envisage given the lack of capital and the lack of demand. The demographic characteristics

⁶ Kingsley Davis, "Demographic Fact and Policy in India," *Demographic Studies of Selected Areas of Rapid Growth* (New York: Milbank Memorial Fund, 1944), p. 47.

of such areas are simply one of several principal obstacles to economic development in general and to the use of atomic power in particular. I am not implying that they constitute obstacles which cannot be overcome, any more than I am denying that the use of atomic power could increase the productivity of specific industries in such areas. I am simply underlining that while cheap power may be a necessary condition for industrialization, it is not a sufficient one. Successful utilization of atomic power in the underdeveloped regions is hampered by present social organization. Its use could, conversely, be one of the factors leading to modifications in cultural arrangements and behavior, but only as it successfully induced general economic development.

WESTERN SOCIAL ORGANIZATION

There is space for only a brief further word about the industrialized nations. What has already been said suggests that their social organization is generally receptive to the use of atomic power. Social change is a usual condition. Technological innovation is expected and welcomed as a means of attaining higher standards of living. The demographic situation is favorable, since the degree of control exercised over both births and deaths makes it possible to maintain a ratio of numbers to available resources which will permit further increases in productivity to be applied to production and consumption needs rather than to the support of a mushrooming population. Economic arrangements too are more favorable than in the underdeveloped countries, though there is national variation in the availability and cost of capital, the investment in competing power sources, the size of market, the need for additional power or energy resources, the mobility of the labor force, and so on.

There is no evidence that in these countries atomic power will effect the revolutionary changes in social organization which have frequently been predicted in popular and semipopular literature. It is not likely to create a new type of family or of economic system or of class structure. Rather, it will fit readily into established economy and society, and at most promote social changes already in process. In partially industrialized countries like Argentina, it can speed such changes considerably if it is actually utilized.

ECOLOGICAL AND DEMOGRAPHIC CONSEQUENCES OF ATOMIC POWER

In the short space remaining, I want to mention briefly certain implications of the use of atomic power for community and population patterning. The underlying premise here is, again, that atomic power will in the next several decades prove a valuable adjunct to other power sources but that it will not lead to revolutionary changes in economic organization, settlement pattern, or population trends. Obviously, if atomic power combines with other factors to induce lasting industrialization in any presently underdeveloped countries, the latter part of this assumption will be modified for those areas in ways suggested above.

It is technically possible to build atomic power plants in the most remote areas of the world. The possible should not, however, be confused with the probable, and, except for portable units for such specialized jobs as breaking down icebergs, I see no logical reason for such an undertaking. Only in a few industries, like the electroprocess group, is cheap power of sufficient importance in inducing plant location ever to outweigh other single locational factors such as transportation, markets, labor force, raw materials, and agglomeration economies. An atomic power

station in Spitsbergen, or even in Aroostook County, Maine's northern potato empire, would have no function without a market. For a plant of optimum size, a major industrial agglomeration would be required; but other locational factors militate against such a possibility. Hence, atomic power is not likely to develop new population aggregations at remote points.

It is at least conceivable that military considerations might lead to uneconomic industrial concentrations, supported by subsidy, in distant areas like that around Arco, Idaho. It is more likely that, as in the United States in World War II, the concentration of industry in present locations will be strengthened because of their established locational advantages, the investment already made in these areas, and so on.⁷ In this country the industrial areas of the Northeast and along the Great Lakes rim are best suited as locations for atomic

plants, since they constitute principal areas of demand for power.

It seems probable that atomic power will serve to increase still further the concentration of industry, and therefore of population, in these established areas. It could also spur the industrial growth of such a region as southern California if it became competitive in cost with other power sources. Ecologically, this means a continuing expansion of the major metropolitan districts, presumably with a further dispersion of subcommunities within the metropolitan areas. It does not suggest any more uniform distribution of population in the major industrialized countries, or that such present population centers as New York or London or Moscow or Tokyo will become "ghost towns."

These remarks are necessarily extremely abbreviated. They can only suggest that existing demographic and ecological patterns are likely to be highly consequential for atomic power utilization everywhere. At the same time, they imply that any probable peacetime use of nuclear energy is unlikely to modify radically these same demographic and ecological arrangements.

⁷ Atomic power is unlikely to lead to the relocation of basic American industries. This is true even when the use of atomic power to allow new industrial processes is considered. For the evidence, see Walter Isard and Vincent Whitney, "Atomic Power and the Location of Industry," *Harvard Business Review*, Vol. 28, No. 2 (March 1950), pp. 45-54.

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Congress and the Atom

By HENRY M. JACKSON

FEW students of government would acknowledge the birth of the atomic age as a landmark in the history of American constitutional law; yet the pattern of relations which has evolved between the Congress and the executive branch in atomic energy is almost as unique as the splitting of the atom itself.

The ordinary government agency functions in a glare of publicity. Through the sheer force of public opinion, the people can themselves often shape official policy. But not so in atomic energy. The world of the atom is covered with a veil of secrecy. And even if secret data were more widely circulated, few laymen could understand their full import unless prepared to spend long and arduous hours in a study of atomic problems and issues. Against this background, five Atomic Energy Commissioners, whose only tangible link with the American people is their appointment by the President and their confirmation by the Senate, have been empowered to make decisions which not only affect our hopes for material advancement, but which may very well determine our national survival.

RESPONSIBILITY OF THE JOINT COMMITTEE ON ATOMIC ENERGY

These were the considerations in the mind of the Congress when, seven years ago, it created the Joint Committee on Atomic Energy to oversee the national atomic energy program on behalf of the Congress and the American people. The McMahon Act of 1946, which established the civilian Atomic Energy Commission, also created the Joint Committee and required it "to make continuing studies of the activities of

the Atomic Energy Commission and of problems relating to the development, use, and control of atomic energy." In turn, the Commission was required to keep the Joint Committee "fully and currently informed" concerning its programs.

As long as one speaks in the traditional language of constitutional law—with its black-and-white divisions between co-ordinate and coequal branches of the government—it is difficult to define the Joint Committee's precise role in atomic policy-making. This watchdog group has been accused both of running the atomic energy program, and of acting as a mere captive of the Commission. Neither view is correct. In truth, the Committee and the Commission jointly run the atomic program. Fundamental policy, though normally originating within the Commission, tends to be made with the advice and consent of the congressional committee. And in the case of certain vital policy decisions, the urging from the Joint Committee has played so powerful a role that it can be said the Committee made the decisions, with the advice and consent of the executive branch.

Some may lament this dual responsibility, arguing that it blurs vital divisions of authority between legislators and administrators. Others may insist that, in atomic energy, the power of Congress must be very great, in order to offset the immense authority afforded the executive branch in the McMahon Act. However history may judge this unique Committee-Commission relationship, it cannot be doubted that it now merits the closest possible examination by students of political science.

The McMahon Act entitles the Committee only to be kept "fully and currently informed" concerning the activities of the Commission. This mere right to know, with no legal authority to direct or supervise, may seem at first glance a frail foundation for Committee authority. Yet in atomic energy, this simple right to know highly classified information in and of itself confers immense powers of moral suasion upon the Committee. Here, in a most literal sense, knowledge is power.

Apart from the highly classified documents which the Atomic Energy Commission regularly transmits, the Joint Committee itself originates many secret papers covering all phases of the atomic program. It keeps in daily and intimate touch with the defense establishment, the State Department, the Central Intelligence Agency, the Federal Bureau of Investigation, and the National Security Council. Every effort is made, through a twenty-four-hour armed guard over the Committee offices and through appropriate use of vaults, safes, soundproofing, electronic devices, exclusion areas, FBI investigations of staff personnel, and the like, to maintain standards of security vigilance at least as high as those maintained within the executive branch.

ROLE OF THE JOINT COMMITTEE

The great fund of secret knowledge entrusted to the Committee has created a number of dilemmas for its membership. From a strictly legal standpoint, the watchdog group is required only to keep itself abreast of atomic developments. Should it therefore play a passive role, accepting the information furnished it and expressing no opinions of its own? Or should it assume an active role? If the latter, should it pass judgment on decisions of the executive branch only after they are made? Or should the Committee take a position

before far-reaching issues are decided? And if the Committee is to regard its mandate in this active sense, where should it draw the line in intervening in the affairs of the executive branch—where does prudent stewardship end and destructive meddling begin?

The question may be asked in specific ways. Should the Committee urge the building of certain plants which it feels that the interests of national security require? The Committee has in fact made such urgings. Should the Committee have access to confidential FBI reports on atomic employees? The Committee in fact has such access—the only group of Congress that does. Should the Committee insist upon seeing the internal staff papers of the Commission and the minutes of the Commission's meetings? The Committee has never so insisted, because the members respect the Commission's need for a certain privacy in its internal functioning. Should the Committee be informed of Commission decisions before they are reached, or only afterward? In actual practice, it knows about the big issues well in advance of any solution, but on lesser matters it is often advised following a decision.

How about the awarding of contracts, the hiring of Commission personnel, and the selection of plant sites? Should the Committee participate in these matters? In practice, it has not participated. It has followed a strictly hands-off policy—and rightly so, I believe.

COMMON-SENSE WISDOM

It may be wondered how the Committee—composed as it is of laymen—can possibly know enough about the technical facts of atomic energy to formulate sensible policy conclusions. The Committee, true, has come to rely upon the advice of its small but highly trained professional staff. Yet I do not believe this goes to the heart of the

matter. If the Joint Committee members can make rational decisions on high questions of atomic policy—as I believe they do—it is, I think, primarily because laymen may well be better qualified than specialists to play the role of basic policy-makers. After having worked with atomic problems for some years, I am deeply convinced that wise policy—in the sense of basic programmatic decisions—depends far less than most people imagine upon an exquisite technical acquaintance with atomics. A minimum understanding of the specialized lore of atomic energy is of course indispensable. Yet such knowledge can be translated into rational public policy only by decision-makers who can relate it meaningfully to the totality of human and historical experience.

A few examples may help to make my point. Just a few years ago, many technically trained people insisted that the supply of uranium raw materials was rigidly limited, and that such fixity of supply placed a sharp upper limit on the output of atomic weapons. Not a single member of the Joint Committee possesses a mining degree. But even as laymen, they knew that in the case of copper or iron or gold or almost any raw material which can be named, greater exploration and mining effort pays off in greater production. So, the views of many technicians to the contrary notwithstanding, the members of the watchdog group concluded that our nation could procure uranium in far greater quantities if it was willing to pay the necessary price; and of course this turned out to be so.

Again a few years ago, many military experts insisted that atomic bombs could never be carried by fighter planes against tactical targets; they argued that the bomb simply could not be made small enough or light enough. Once more, no member of the Joint

Committee really understood the intimate details of weapons technology. But as laymen, they could recall no piece of ordnance within human experience which could not be refined or improved or reduced in size. In addition, they sensed that even the experts in the infant science of atomics had no more final knowledge about atomic weapons than the experts had final and complete knowledge of aerodynamics at the time the Wright brothers flew at Kitty Hawk. Many of the Committee members therefore urged—years before the doctrine gained wide acceptance in the Pentagon—that atomic weapons could and should be adapted to tactical uses.

Perhaps this is only another way of saying that the congressional watchdog committee has served as the guardian of the obvious in atomic energy. It has tried to make sure that the simple propositions and the everyday truths are not overlooked in the world of atomics, as they can be so easily in a subject which is synonymous with complexity. Ours is an age, if I may be permitted a philosophical digression, which revels in complicated technics and subtle philosophies. We peer into the most distant reaches of the universe and try to divine the ultimate meaning of things. But in so doing, we may sometimes overlook what is standing directly in front of our faces. The memorable admonition of Justice Holmes, that the vindication of the obvious is as important as the elucidation of the obscure, has not lost its relevance in this atomic age.

LEADING RATHER THAN RESTRAINING

Not that the history of these first years of the atomic era will ever be entitled "The Joint Committee was always right." Far from it. Although the Committee has consistently led the executive branch in its insistence on an all-out weapons production program, I

regret that it did not press for an expanded effort even earlier and even more vigorously than it did. And the same holds true on the peacetime side of the atom. The Committee's present chairman, to his great credit, is urging that our nation achieve a practical demonstration of useful atomic power as soon as is humanly possible.

This much, at any rate, is clear: This watchdog group simply does not conform to the popular stereotype of a congressional committee. Most people think of legislative committees as veto groups—as bodies overridingly concerned with holding the executive branch in check and preventing capricious acts. This is of course one of the vital jobs of the Joint Committee, and it performs it as best it can. More often than not, however, the Committee finds itself saying to the executive branch not "Do less; do it more cautiously," but "Do more; do it more boldly." And for every time the members ask "Isn't this program too ambitious?" they find themselves asking a dozen times "Isn't this program too cautious?"

This often surprises newcomers to Washington and to the executive branch. Having been reared on the doctrine that the executive branch proposes and the Congress disposes, they appear for the first time as Joint Committee witnesses, expecting to earn their battle stripes through defending their plans against charges of excessive boldness. But, to their surprise, they normally find themselves winning their Purple Hearts while fending off charges of excessive timidity.

PROCEDURE AND LEADERSHIP

The Committee is not very often in the headlines—which, I believe, is all to the good. Its work proceeds informally, with a minimum of fuss and feathers and klieg lights. In conformance with necessary security require-

ments, about three-quarters of the hundreds of meetings the Committee has held have taken place in executive session. The members have heard testimony from virtually every ranking government official, scientist, and military man connected in any way with atomic energy. At least once a year members or staff representatives inspect each field installation of the Commission, of which there are dozens. Trips to such major sites as Hanford, Oak Ridge, Los Alamos, Savannah River, and Paducah occur routinely at much more frequent intervals.

The performance of any congressional committee in large part reflects the quality of its chairman. On this score, the Joint Committee has been singularly fortunate. It is impossible to overestimate the contributions of the late Senator Brien McMahon to the national atomic energy program. He will be long remembered as sponsor of the Atomic Energy Act of 1946, and as a magnificently able chairman of the Joint Committee. Senator Bourke Hickenlooper, the first chairman of the Joint Committee, earned this nation's gratitude for his largely singlehanded—and successful—fight to save the atomic energy appropriations during the waning hours of the Eighty-second Congress. Congressman Carl Durham took the initiative in pressing for hearings on atomic power. The Committee's present chairman, Congressman Sterling Cole, has already won the respect and admiration of his colleagues on both sides of the aisle. In the Joint Committee, this aisle has become of less and less significance; the Committee has a firm, long, and growing tradition of bipartisanship.

APPROPRIATIONS PROCEDURE

When the McMahon Act was under consideration, Congress tended to believe that both international control and

industrial power from the atom might soon become realities. It therefore seemed sensible to furnish sweeping authorization for the appropriating of funds, since such authorization, besides smoothing the path of the civilian Commission in its first year or two in office, might shortly give way to different provisions. But what may have made sense in 1946 does not necessarily make sense today.

The Joint Committee, even now, is not empowered to report out authorizing or enabling bills—to the great detriment, I think, of the atomic program. If the Department of Defense wishes to construct a radar network or a new air base, four steps are necessary to secure congressional approval. The relevant legislative committees—that is, the Armed Services Committees of the House and the Senate—must report out an enabling or authorizing bill, which the Congress must pass. The Appropriations Committee must then report out a bill providing funds for the project in question, and the Congress must also pass this.

The wisdom of such a procedure has been demonstrated again and again. The relevant legislative committees which first evaluate a new construction program of the executive branch are uniquely equipped, through their specialized knowledge and experience, to decide whether it is desirable. If these committees place their seal of approval on the project through a favorable authorizing bill, the Appropriations Committees are subsequently assisted in considering the project from the point of view of how much money should be voted on its behalf, and how such sums will fit into the nation's over-all budget. The legislative committees, in these cases, serve as programmatic experts in their respective fields, and the Appropriations Committees serve as general fiscal experts.

The logic of such a procedure would seem especially compelling in atomic energy. Here, it is simply impossible to estimate the desirability of Commission-sponsored construction programs unless one has great familiarity with the atomic project—a familiarity which can be acquired only through day-by-day contact with the program. Although they are men of great judgment, ability, and experience, the members of the Appropriations Committees have immense demands on their time, and they have not acquired specialized competence in matters atomic. For the most part, their acquaintance with the program is transient and casual.

The ensuing difficulties can be illustrated by a hypothetical case. Suppose the Commission plans a reactor development program which may ultimately cost hundreds of millions of dollars. Suppose the Joint Committee, after holding detailed hearings, believes that the program is undesirable. Suppose it believes that construction of the proposed reactors is premature at this time. Let us even suppose that the Committee becomes convinced, on the basis of expert scientific testimony, that building the reactors would represent an extravagant waste of resources, or that the possibility of a radiation accident might endanger the lives of people living near the reactor sites. In any such cases the Commission would remain legally free (so broad is its present authorization) to proceed as it saw fit, provided it secured funds from the Appropriations Committees.

The resultant danger of ill-advised action is less acute in the Senate than in the House. Senate rules permit three members of the Joint Committee to sit as ex officio members of the Senate Appropriations Committee when the atomic budget is being considered. The regular members of the Appropriations Committee have come to heed the counsel of

their ex officio colleagues, and the Senate has exhibited great responsibility and rare discrimination in its handling of atomic energy appropriations.

Efforts to institute a similar arrangement on the House side have so far proved unavailing. Fearing encroachments upon its prerogatives, the House Appropriations Committee has denied requests for ex officio participation in its deliberations by Joint Committee members when the atomic budget is being studied. The House approach to appropriations in the atomic field has accordingly suffered, and on several occasions dangerous cuts have been restored only when the appropriations bills of the two Houses have been reconciled in conference.

Last year, for instance, the House Appropriations Committee—with the laudable objective of encouraging economy, but with mistaken notions of how to bring it about—reported out an atomic energy appropriations bill whose restrictive riders would have seriously delayed completion of the vast plant expansion program which had just been launched by the executive branch. The Senate—thanks in good part to the missionary work of its Joint Committee members—resisted the House-endorsed bill. After a dramatic all-night debate which delayed the adjournment of the Congress, the Senate view prevailed and the atomic expansion program was permitted to go forward unimpaired.

"THE ATOMIC EQUATION"

It would be both impractical and unnecessary to desire that every legislator acquire in atomic energy the kind of competence possessed by Joint Committee members. The whole point of the committee system of operation, after all, is to provide for specialists in public policy—for experts whose knowledge of some particular field transcends that of their congressional colleagues. So it should occasion no alarm if not all legislators are qualified to decide whether the Commission should build plant X or plant Y, or whether it should concentrate on developing this or that model of atomic weapon.

What can and must be asked, however, is that every last member of the Congress understand the meaning of "the atomic equation"—the terrible portent of the growing stockpiles of atomic weapons now being amassed on both sides of the Iron Curtain. What can and must be asked is that every member of the Congress recognize the imperative necessity of maintaining and increasing our atomic lead over the Soviets. What can and must be asked, finally, is that the entire Congress recognize that the atom has two sides—that the same materials which can destroy society in the form of atomic weapons can immeasurably enrich our lives if harnessed in the form of perceptive applications of atomic energy.

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The Contractor System

By RICHARD A. TYBOUT

ATOMIC energy is a contractors' industry. It was so created by the wartime Manhattan Engineer District and has been so continued by the Atomic Energy Commission.

Approximately 95 per cent of the total expenditures of the Atomic Energy Commission in fiscal year 1953 were made through contractors. Private concerns under contract construct the plants, refine the uranium, produce the fissionable materials, fabricate the atomic weapons, and develop new atomic engines for war and peace. Academic bodies search for new knowledge under contract. Contractor employees numbered 142,000 of the 149,000 persons in the atomic energy industry in June 1953. The remaining 7,000, exclusive of 65 or 70 military personnel, were employees of the Atomic Energy Commission.

ORIGINS OF THE CONTRACTOR SYSTEM

The talent for conduct of industrial and academic work of the type required in the atomic energy program resides primarily in private firms and in the universities. Cognizant of this fact, the Manhattan Engineer District provided the physical facilities for the atomic bomb project at government expense, but engaged private contractors for their operation. No one asked for, expected, or wanted private investment, though the services of operation by private concerns were highly desired. The result was government ownership and contractor operation under the cost-plus-fixed-fee contract form, which was then and still remains the key to contractual relationships in atomic energy.

With the passage of the Atomic Energy Act of 1946, the contractor system

received legislative sanction. Government ownership of the major portion of the atomic energy industry was required by statute. The Atomic Energy Commission was authorized and urged to continue the practice of relying upon private concerns for services of operation. And a new ingredient in atomic energy, the promotion of peacetime applications, was incorporated in domestic policy. This last made the Commission responsible not merely for the support of research in fields giving promise of peacetime applications, but also for the creation and preservation of competition in any future private atomic energy industries. At the present stage in the development of peacetime applications, however, the only means for the introduction of competition center around the contractor system, which, it will be shown, necessarily provides but limited scope for the independence essential to effective competition.

TYPES OF CONTRACTS

It has already been noted that all the major installations of the atomic energy industry are government owned and contractor operated. For these operations, cost-reimbursement type contracts, of which the cost-plus-fixed-fee is the most important, are almost invariably used.¹ Cost-reimbursement contracts typically account for 85 per cent by value of all prime contracts of the Atomic Energy

¹ The only exception is the case of certain government-owned plants for the production of uranium metal and uranium compounds, where the contracts are ostensibly unit-price contracts but permit price redetermination at three-month intervals. In practice, cost-reimbursement principles have prevailed in the redetermination process.

Commission. The remaining 15 per cent are fixed-price contracts, which are used in peripheral areas and in the procurement of standardized goods and services.

Fixed-price contracts

Fixed-price contracts may be either lump-sum or unit-price contracts. There is no fundamental difference between the two, but only a difference in the manner of expressing a fixed commitment. The contractor may agree to construct a building for a stated lump sum or to deliver so many tons of a chemical at a given unit price per ton. If there is free and open competition for such contracts, they provide all the built-in safeguards of a market-directed economic system.

But experiences of the Atomic Energy Commission in using fixed-price contracts are significant for the modifications which have been necessitated by the conditions of atomic energy contracting. As one moves more in the direction of contracts for nonstandardized goods, the probability of encountering classified plans and designs becomes greater, and the possibility of public advertising for competitive bidding becomes less. The special qualifications of individual contractors assume more importance, the unknown facts of new technologies become more significant, and the likelihood that fixed-price contracts, if they are used at all, will be placed by negotiation is increased. The consequences are progressive reduction in the effectiveness of competition and a tendency toward explicit coverage of the contractors' costs, with explicit allowance for increasing risks in the form of contingency adjustments, and explicit allowance for "profits."

The ultimate in the transfer of risks from the contractor to the government is found in the cost-reimbursement contracts.

Cost-reimbursement contracts

Cost-reimbursement contracts are of two major types—the cost contract and the cost-plus-fixed-fee contract—distinguished by the fact that the latter includes a fee to the contractor negotiated in advance and fixed for the life of the contract.² In both cases, all expenses properly charged to the services rendered are paid by the Commission, invariably from working capital advanced to the contractor.

Cost-reimbursement contracts are used where it is not feasible to require risk assumption by the contractor or where such risk assumption would serve no useful purpose. They are not limited to the operation of government-owned plants, but may be used under other circumstances also. Because of urgency, a construction job may be started before all the details have been sufficiently developed to permit contracting for a firm price. In this case a cost-plus-fixed-fee contract is used.

Cost contracts, as opposed to cost-plus-fixed-fee contracts, are particularly suitable for research programs carried out by academic and nonprofit institutions, either in their own or in government-owned laboratories. Research endeavors, by definition, are inquiries into the unknown; consequently it is not possible to make precise determinations of costs in advance of achieving given research goals.³

Cost-plus-fixed-fee contracts

The cost-plus-fixed-fee contract is not confined to atomic energy work. It was

² Government contracting on the inefficiency-rewarding cost-plus-percentage-of-cost basis is prohibited by law.

³ The so-called "lump-sum" research contract is also employed in financing research. It provides a fixed sum, not usually the anticipated total, for a given research undertaking in a nongovernmental laboratory.

used extensively in World War II, accounting for about 30 per cent of all contracts by value, but a negligible proportion by number.⁴ Studies of wartime experience reveal differences of opinion on many points, but there is unanimity among commentators, academic and otherwise, as to the suitability of cost-plus-fixed-fee contracts for the industrial operation of government-owned facilities, if the facility is one for which private enterprise will not assume the risk of investment or the risk of production for a market.

Is this an industry in which private enterprise should assume the risks of ownership and production? The answer depends in part upon the expected stability of defense needs in atomic energy, and in part upon the prospects for peacetime applications of atomic technologies.

One needs no special insight, but merely the public statements of all responsible officials, to know that expectations for stability in the atomic energy industry are nil. Continuous change in weapon design is implied by the existence of the Los Alamos Scientific Laboratory and by the frequency with which public announcements are made regarding weapons tests. It would appear that changes in quality and quantity specifications are the rule rather than the exception. At the other end of the production system, changes in the grade of domestic ore processed are of sufficient importance to warrant specific contract adjustments, to say nothing of the fact that the United States is heavily dependent upon the Belgian Congo and Canada for high-grade uranium ores, which introduces the complexities of foreign policy into production planning.

All the foregoing considerations intro-

duce a high level of variability into production activities, a variability which is close to national military planning. It is hard to see how private risk assumption, presumably operating through markets, could better serve the national interest under these circumstances than can the atomic energy industry (as a defense industry) working under direct governmental control.

The second part of the answer envisages an entirely different situation. If there is a peacetime market for fissionable materials, and if there is an established social utility in diverting fissionable materials from defense to peacetime applications, then there is the usual expectation that private ownership and private risk assumption will redound to the public benefit. It is reasonable to expect that at the beginning, at least, a peacetime atomic energy industry would be one of rapid obsolescence. There would be need for a continuing public policy to assure the essentials of competition and free entry, and perhaps a continuing need for public sponsorship of atomic research.

Thus, for the foreseeable future of defense contracting, public ownership and the cost-plus-fixed-fee contract device are likely to be of continuing importance. For the more distant future of peacetime applications, other arrangements, to be discussed at a later point, may be more appropriate.

COST-PLUS-FIXED-FEE AND EFFICIENCY OF OPERATION

The strongest criticism of the cost-plus-fixed-fee contract form is that it provides no incentive for efficiency in operations. The contractor is assured a fee, or "profit," which does not vary with performance under the contract. There is, of course, the possibility that the contractor may be interested in securing additional contracts, and for this

⁴ War Production Board, Bureau of Program and Statistics, *Cost-Plus-Fixed-Fee Contracts in the War Program* (March 1945), p. 1.

reason would wish to turn in a creditable performance. But it would seem just as valid to argue that the cost-plus-fixed-fee form provides an incentive to inefficiency if costs are kept up on one contract to establish higher estimated costs and therefore higher fees on subsequent contracts.

Despite the logical presumption that the cost-plus-fixed-fee form is inferior from the standpoint of efficiency of procurement, this proposition has by no means been satisfactorily verified. Indeed, J. P. Miller⁵ cites statistical evidence indicating lower over-all costs incurred by cost-plus-fixed-fee contractors than by fixed-price contractors in the production of identical airplane engines and propellers. This outcome seems to have resulted from the fact that the unit-price producers insisted upon a wide margin to meet the great uncertainties as they saw them. Since the cost-plus-fixed-fee contractors were not called upon to bear the risks, they did not require the large safety margin. The government was called upon to pay only those operating costs actually incurred, plus the fixed fee, which did not raise costs to the government to the same level as under the unit-price contracts.

The example is not regarded as typical of World War II experiences, but indicates that the cost-plus-fixed-fee device may sometimes be desired from the standpoint of over-all costs of procurement, even when the contractor is willing to operate under a unit-price contract. Presumably, there is some unit price which would be sufficiently attractive to induce private investment with full risk assumption in fissionable materials plants. That such a price may be entirely incomparable with present unit costs, whatever they may be, is suggested by previous discussion of the

implications of full risk assumption in the atomic energy defense program.⁶

THE FIXED FEE

It is the intent of Commission policy that cost-plus-fixed-fee contractors emerge from their atomic energy operations financially whole in all respects and that they receive a fee which provides a financial return over and above all direct and indirect costs. The fee is fixed for the life of the contract, as long as the contract is not amended in a way that adds significantly to the work to be done by the contractor.

The size of the fee received by different contractors varies widely. A few of the largest atomic energy contractors operate for the purely nominal sum of one dollar for the life of their contracts. Other contractors are content with a fee which covers home office expenses attributable to atomic energy activities. Such expenses are reimbursable under cost-plus-fixed-fee contracts, but the practice of having them covered in the fee is sometimes preferred because it avoids the necessity of having the Commission audit home office costs. Still other contractors receive fees in the range of 3 to 7 per cent of estimated operating expenses under their contracts.

The economic logic of the fixed fee is tenuous at best. The fee is not a payment for risk assumption in an immediate financial sense, since the Commission takes considerable pains to ensure that contractors sustain no losses as a result of atomic energy work. A more satisfactory explanation views the fee as a compensation to the contractor in

⁶ In the event that costs are sufficiently well known in advance, an incentive schedule of fees might be established. The Bureau of Ships, Navy Department, employed such an arrangement with some success. For details see Glen A. Lloyd, "Pricing in War Contracts," *Law and Contemporary Problems*, Vol. 10 (Winter 1944), pp. 151-52.

⁵ John Perry Miller, *Pricing of Military Procurements* (New Haven, 1949), p. 132.

lieu of profits⁷ which might otherwise have been earned by the employment in more profitable ways of persons assigned to atomic energy work. But the longer the time since such persons were committed to atomic energy activities, the more likely it is that their former places in the contractor's organization will be satisfactorily filled by others. Thus, the real sacrifice of the contractor in terms of profits forgone is related more to problems of replacement of individuals and organizational disruption of lucrative undertakings. These are transitional matters which have their greatest importance in periods of adjustment, as upon the assumption of contract responsibilities.

Other intangible and inexactly measured influences affect the size of the fixed fee. The nominal one dollar "fee" is sometimes chosen as a means of offsetting the public opprobrium which may be connected with the production of war goods for a profit. On the other hand, a nominal fee does not necessarily mean an absence of compensation. What is not received in the form of a fee may be received in terms of nonfinancial benefits accruing to the contractor. The situation raises the question of the exact nature of private interest in atomic energy contracting—a matter which can best be explored in terms of the administrative relationships described in the following paragraphs.

COST-PLUS-FIXED-FEE ADMINISTRATION

It has been shown that cost-plus-fixed-fee contracts seek to establish administrative relationships for the conduct of a task which can be described only in

the most general terms in the contract. This is in direct contrast to the situation in traditional contract arrangements, epitomized in the fixed-price forms, where advance commitments regarding the details of the contractual job are the essence of the contract device. The novel and close working relationships to which cost-plus-fixed-fee contracts give rise are the most significant aspects of these contracts, and, at the same time, present broad social questions regarding the nature of the economic institutions which they create.

Cost-plus-fixed-fee administration begins with a review of the qualifications of individuals assigned to atomic energy work by contractors. The Commission is interested in the quality of the team with which it must deal in working out the contractual relationship and in the conduct of the tasks to be undertaken by the contractor. This aspect of contract administration is of such importance that the letting of particular contracts is often dependent upon the contractor's assigning specific individuals to atomic energy work. As a result of the variability in the work to be done under cost-plus-fixed-fee contracts, the ultimate safeguard of the Commission's interests can be found only in these terms.

Other aspects of contract administration look toward achievement of an appropriate balance between effective control of contractors' activities and preservation of adequate latitude for freedom of contractor operation. At the top executive level of program direction, quantity and quality of product outputs are determined by the government. At the next executive level, co-ordination of activities among the different production and research installations is a direct Commission function, with some degree of private participation in the case of a few of the largest contractors, who are engaged in the operation of more than one installation. Finally, at the

⁷ A distinction is often made between risk assumption and uncertainty bearing as a functional role of profits. Frank H. Knight, *Risk, Uncertainty, and Profits*, Boston, 1921. This distinction may be neglected for purposes of the present discussion.

various production sites, Commission officials and their staffs exercise continuing review down to a management level comparable to that of the contractor's plant superintendents.

The result of the administrative intimacy of the Commission and its contractors has been the creation of an atomic energy organization consisting of interlarded strata from the public and private sectors of the economy.

Such is the nature of the administrative organism which has grown up in the no man's land between public and private. It leads a relatively autonomous existence, separated by a layer of secrecy from the main stream of public and private institutions from which it has borrowed. From all publicly available information, it appears to have done a creditable job of producing war goods. Whether this is a consequence of the unique arrangements here involved or of transfusions from other sectors of the economy cannot be answered simply. The answer, which no attempt is made to give at this point, must be found in the details of the relationships studied in the previous paragraphs, interpreted in terms of the contemporary functioning of private industry elsewhere in the economy.

PEACETIME APPLICATIONS

Cost-plus-fixed-fee contracts have significance not only as effective instruments of procurement in atomic energy, but also as harbingers of the industrial structure of future peacetime atomic energy industries. The latter role, which will be discussed in the following paragraphs, is one in which cost-plus-fixed-fee contracts have been cast by the circumstance that the field of atomic energy is possessed of both peacetime and wartime applications. They are not intrinsically well suited to the development of a competitive structure for

peacetime industries, but have been somewhat adapted to this end, subject to the overriding objectives of national defense.

The terms of atomic energy contracts, consistent with the spirit of the Atomic Energy Act, seek to keep all industrial atomic energy knowledge in the public sphere. Thus, all patentable discoveries in the field of atomic energy and all technological information—data, notes, drawings, and so forth—become the property of the Atomic Energy Commission. A considerable number of government-owned patents in unclassified areas have been released for non-exclusive royalty-free licenses, and a large volume of unclassified technological data has been published. Presumably the same will be done with other patents and atomic energy information, including what must be a sizable literature relating to the development of power-generating reactors, when and as they are declassified.

The intended effect of the foregoing policies is to reduce the private advantage of atomic energy contractors that lies in the industrial experience, training, and know-how which members of their staffs receive while engaged in atomic energy work. But it is the writer's observation that at the two major production installations, Oak Ridge and Hanford, operating personnel tend not to be closely tied to particular contractors. They would probably be just as available to a large number of private firms as to the firm for which they are nominally working.

More vigorous efforts to develop a cadre of specially trained personnel within their own ranks are made by contractors in reactor development work—that part of the atomic energy industry closest to peacetime applications. Centrally conducted reactor development training programs for contractors' employees have long been sponsored by

the Commission, and the rotation of personnel between a contractor's home installation and reactor development installation is in accordance with accepted policy.

Manifestations of private interest in reactor development have been numerous, but it is significant that the initial proposals for private action in this area came from two groups—the Monsanto Chemical Company and the Dow Chemical Company, the latter in combination with the Detroit Edison Company—which had had long and absorbing contacts with atomic energy. Without such contacts, their proposals could hardly have been conceived. The field is technologically complex, and secrecy restrictions introduce a necessary waiting period before firms outside the atomic energy program can even begin to think about the problems involved, to say nothing of making proposals for their solution.

DEFENSE VERSUS PEACETIME INDUSTRIAL STRUCTURE

Further constraints upon the competitive structure of peacetime atomic energy industries are inherent in the attributes of cost-plus-fixed-fee contracting. Private concerns have been engaged in order to bring special talents into atomic energy, but the particular private concerns most likely to have sufficiently specialized talents are generally the largest in an industrial segment. Moreover, large firms are best able to supply a variety of specialists to meet changing technological requirements, and management talent in depth at each level to meet shifting needs in volume of output.

Not only is the case predisposed in the direction of large operating contractors, but the inherent rigidities of the contractual relationship tend to keep contracts in the hands of their present

holders. The intimate administrative contacts upon which cost-plus-fixed-fee contracts depend require time for their establishment and are not lightly severed by the Commission. Compounding these difficulties are the secrecy restrictions which, however necessary on other grounds, seriously obstruct competition from without the circle of the initiated.

THE FUTURE OF INDUSTRIAL ATOMIC ENERGY

Despite the bent of the present contractor system in the direction of established interests, it is entirely possible that normal competitive relationships could be developed under the aegis of the government, at least in limited sectors of the field.

If and when atomic energy defense needs permit a limited relaxation of cold war production patterns, much by way of disseminating industrial know-how might be accomplished by increasing the number of firms participating in the operation of selected atomic energy installations. And if full and current release of relevant industrial information can be achieved without impairing national security, while keeping rights to atomic energy knowledge in the public sphere, as they now are, then the most serious roadblocks to a future competitive structure in peacetime applications will have been substantially reduced.

The atomic energy industry is in the first stage of its development. The contractor system under which it operates has been well adapted to the needs of this stage, namely, the production of atomic weapons. Now, as a result of technological advance, the problems of the gestation of a peacetime atomic energy industry are becoming more acute, and point, for their solution, toward increasing emphasis on a new order of business-government relationships. But

only after a broad base of competitive industrial participation has been developed will it be consistent with the public interest in this new field to move on to the later stage of full-scale private ownership and operation.

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The Problem of Secrecy

By JOHN GORHAM PALFREY

THE impact of atomic secrecy on the conduct of atomic affairs and on the processes of government, science, and industry is no longer an unexamined subject. Whenever seriously examined, this impact, despite the multiple language used in defining it, has almost uniformly been regarded as unhealthy, and in some degree unnecessary.

It has often been stated that secrecy has been overrated by the government and has not accomplished what was expected of it. Particularly, it has been said that the cost of secrecy has outweighed its contribution, and that a more balanced evaluation of both could reduce the cost without reducing the actual contribution to our safety.¹

SIGNS OF FERMENT

Heretofore, these appraisals have not led to noticeable reform. But by 1953 there are signs that a change may be imminent. For one reason, critical judgments have come from sources that cannot be described as inconsequential. Two former chairmen of the Atomic Energy Commission,² the present and a former chairman of the Joint Committee on Atomic Energy,³ the former chairman

of the Commission's General Advisory Committee,⁴ and just recently the President of the United States,⁵ all have concluded, some more emphatically than others, that more atomic information should be disclosed.

For a second reason, the signs of disenchantment and discontent have been coupled with pressures from interested groups who have a particular reason for demanding that the assumptions of 1946, behind the provisions of the law, be re-examined in the light of present circumstances. The Joint Committee on Atomic Energy has been currently holding hearings on the enlargement of industrial participation in atomic energy, preliminary to the consideration of amendments to the Atomic Energy Act in the next session of Congress. Among the amendments may be one modifying the secrecy provisions of the law.

THE BASIC QUESTION

The criticisms of existing secrecy and the possibilities of change are of profound importance (and our survival may well depend upon the attention they receive and the corrective action taken), but the core of the problem is what these criticisms imply. Behind the evidence of the damage produced by an excess of secrecy lies the fact that

Record A-5316 (1950); Senator Brien McMahon, Interview, *Bulletin of the Atomic Scientists*, January 1952, p. 6.

⁴ J. Robert Oppenheimer, "Atomic Weapons and American Policy," *Foreign Affairs*, July 1953, p. 525.

⁵ Dwight D. Eisenhower, Press Conference, *New York Times*, July 9, 1953, text p. 4, col. 1.

¹ For critical evaluations of atomic secrecy, see Walter Gellhorn, *Security, Loyalty and Science* (Ithaca, 1950), p. 34 *et seq.*; Alan Barth, *The Loyalty of Free Men* (New York, 1951), p. 177 *et seq.*; Ralph Lapp, *The New Force* (New York, 1953), p. 206 *et seq.*

² David E. Lilienthal, "Free the Atom," *Collier's*, June 17, 1950, p. 13; Gordon Dean, Press Conference, June 25, 1953, AEC press release.

³ Representative W. Sterling Cole, "The Hydrogen Bomb: A Panacea?" 96 *Congressional*

despite the country's most earnest intentions, it has lived with the problems of the secret atom for eight years without yet learning what the experience has had to teach it, and without correcting the errors of its ways.

Despite the current signs of ferment, it is not clear that the remedy for excessive secrecy will be produced by specific disclosures or by amendments to the law. Nor is it clear that the remedy will be provided by any contrived solutions to individual problems. The genuine remedy may require a larger pursuit and less immediate results. It may have to begin not with the devising of solutions but with an understanding of the flaws in the whole process of conducting atomic affairs, which, in the course of eight years, has not generated its own correctives as experience has demonstrated the need for them.

It is therefore worth while to consider what has gone wrong, and what has led to the government's failure to identify and maintain the balance between secrecy and openness which would help us most and hurt us least.

Any complete explanation requires a study of the whole varied and intricate political experience, and the changing context in which atomic affairs have been conducted. But in the course of a survey of that experience, one factor does constantly emerge, which, while not determinative of all that has happened, is at least a significant accompaniment of many episodes in many areas affected by secrecy. These episodes involve behavior of the Congress, the Atomic Energy Commission, the President, or the military, which in retrospect seem illogical and costly. And the source of this illogic and expense seems frequently to have been the same: an indiscriminating and unexploratory acceptance of the uniqueness of all atomic secrets in their nature and importance.

SECRECY PROVISIONS OF ATOMIC ENERGY ACT

One can trace this attitude in part to the secrecy provisions of the Atomic Energy Act, although it was more implicitly than explicitly expressed. There was nothing in the policy directives of the information section itself that instructed the Commission to lean over backwards in the interest of concealing and protecting atomic secrets. In fact, the policy declaration plainly provided for a control of secret information by the Commission which would strike the optimum balance between secrecy and openness. The Commission was fully apprised by the act, as amplified by the Senate Committee Report, of the two "vital objectives" of disclosing information that would help scientific progress, and of concealing information that would help the progress of other nations. They were recognized as objectives which "compete with or are in direct conflict with one another," raising "policy considerations of opposite tendency."⁸ The section was designed to frame a program that would "reconcile their apparent divergence."

Nevertheless, in other provisions of the information section there were to be found such compelling indications of the unique importance attached to atomic security precautions as to make the contemplated balance between secrecy and

⁸ Sec 10(a)(1) and (2) provides as follows:

(1) That until Congress declares by joint resolution that effective and enforceable international safeguards against the use of atomic energy for destructive purposes have been established, there shall be no exchange of information with other nations with respect to the use of atomic energy for industrial purposes; and

(2) That the dissemination of scientific and technical information relating to atomic energy should be permitted and encouraged so as to provide that free interchange of ideas and criticisms which is essential to scientific progress.

openness difficult to achieve. These provisions were, ironically, a manifestation of the same qualities that characterize so much that is admirable about the McMahon Act as a whole: a thoroughness and care, coupled with a sense of ferment, produced by the atom's formidable characteristics which made the exception the norm, inventiveness the criterion, and reassessment and departure from ordinary ways acceptable.

SECURITY MEASURES

The difficult problems of atomic secrecy, approached in this spirit, were thought to require more than conventional security measures, and new ones were devised that seemed appropriate to the importance of the subject. In the first place, rather than permit the Commission to determine what information should be concealed, the act made substantially all atomic energy information secret by statutory definition, and established a new category for such information, labeled "restricted data."[†] The Commission was then authorized to declassify information, removing it from this category, as the Commission decided the information could be published without endangering security.

While this device had practical reasons to support it, particularly from an administrative point of view, it had important drawbacks. It gave statutory support to the assumption that all atomic information, unlike other government information, is "born secret,"

[†] Section 10(b)(1) provides as follows:

(1) The term "restricted data" as used in this section means all data concerning the manufacture or utilization of atomic weapons, the production of fissionable material, or the use of fissionable material in the production of power, but shall not include any data which the Commission from time to time determines may be published without adversely affecting the common defense and security.

and it placed on the Commission the burden of justifying the disclosure of information rather than of justifying its concealment, as is ordinarily the case with other "sensitive" agencies.

In the second place, the framers of the act were not satisfied with the adequacy of existing criminal laws, such as the Espionage Act, as protection against unlawful disclosure of atomic secrets. They therefore wrote into the information section special and very severe criminal sanctions.

Lastly, the Congress concluded that personnel security clearance of those with access to secret atomic information could not be left to the agency's discretion, as is customarily the case. Instead, uniformly stringent clearance procedures were provided for all personnel with access to any level of classified information. Except in case of emergency, a full investigation of character, loyalty, and association by the Federal Bureau of Investigation, and Commission clearance, were required, whether the employee was a scientist at Los Alamos working on weapon design, or a temporary construction worker engaged in the rudimentary stages of plant construction. The assumption was plain. Even the lowliest atomic secret merited as much protection as top secret military information.

PRECAUTION ACCENTUATED

The net result of these provisions was that the Commission, in controlling information, was encouraged to conclude that something more than the conventional calculations was required before an atomic secret was declassified or a security precaution modified. If the act itself did not specifically instruct the Commission to adopt this view, both Democrats and Republicans in the Congress made it plain to the Commission, over the years, that such

was their interpretation of the meaning of the law. Senator Tydings typified this attitude when he said, in 1949,⁸ that the atom was not a case of a new 75 millimeter cannon or a supersonic aircraft, but a question of whether or not we were to survive on this planet. Therefore, he concluded, until the world prospect brightened, the Commission would do well to err on the side of secrecy.

What made this attitude particularly important was the fact that it was impressed upon the Commission from the outside, by the public and its representatives in Congress. It therefore accentuated the natural inclinations of the Commission, like any other government agency, to proceed with a superabundance of caution in controlling information. The reasons for this tendency are obvious: Unwise disclosure is irrevocable and exposes the offending official to criticism, while, on the other hand, unwise concealment can always be rectified, and, meanwhile, the act of concealment and the reasons for it are themselves shielded from public observation.

Traditionally, in activities involving military secrets, for example, this inherent tendency toward overconcealment has been at least partly counterbalanced by the jaundiced eye with which the press and, on occasion, the Congress, have regarded military security. Thanks to this outside alertness and aversion to excessive security measures, to a constant pressure to ferret out information, and to the airing of intramural controversy within the military establishment, considerable information has been disclosed and an uneasy balance between secrecy and openness maintained in defense affairs.

Until recently, at least, the situa-

tion was just the opposite in atomic energy. The initiative for disclosure came largely, if at all, from within the Atomic Energy Commission, and furthermore, a penalty was often exacted for such initiative, as the Commission learned in 1949 during the Hickenlooper investigation. As a result, such efforts to disclose more information were not likely to be self-sustaining.

EXAMPLES OF SPECIAL HANDLING

Thus, from the outset, the Atomic Energy Commission was provided with many incentives to play "extra safe" and to err on the side of secrecy. One might debate abstractly the question whether atomic secrets did or did not justly merit this unique protection, either during the period of our atomic monopoly or afterward. But such debate would lack meaning. Concrete illustrations of the types of special handling atomic secrets did receive lead one to a sharper and more fruitful debate. At the same time, these illustrations demonstrate the ways in which this special handling has contributed to much that is both significant and mischievous about the impact of atomic secrecy.

Personnel screening

One major aspect of the secrecy experience was the operation and consequences of the personnel security clearance program. This is a subject discussed in another article. Here, it merits brief discussion only to illustrate one occasion of illogic produced by the concept of playing "extra safe." This occasion demonstrates that Congress not only demanded special clearance to protect all levels of secret information, but also demanded it, as a precaution, even when no secret information was involved.

⁸ Hearings before the Joint Committee on Atomic Energy on the AEC Report to Congress, 81st Cong., 1st sess., pp. 15, 18.

The dispute over the Commission's fellowship program was an important part of the Commission's investigation by the Joint Committee in 1949. It erupted in May with the discovery that an avowed Communist had received an AEC fellowship, and that the Commission had conducted no security screening of fellows working in nonsecret fields. Three committees of Congress bitterly attacked the Commission for lax security. The Commission, in turn, defended its practice on the ground that no secrets were involved. While it subsequently yielded to the extent of adopting the requirement of an oath of loyalty and affidavit of non-Communism (a customary service to assure the proper spending of public money), it steadfastly opposed any security clearance procedures as an unnecessary and dangerous extension of security into nonsecret fields.

The Commission failed to persuade Congress. The outcome was a rider in the Commission's annual appropriation, requiring an FBI investigation and loyalty clearance of the recipients of AEC fellowship awards.⁹ The undeviating congressional attitude was bluntly stated: This special precaution was needed because there was always a chance that a person, even if studying in a nonsecret field, might "hit upon a super-duper atomic bomb, and be off to Russia."¹⁰ In "whatever it does" a "special responsibility" was said to rest upon the Commission "to be particularly sure that it does not contribute to the defeat of the United States in the cold war."¹¹

⁹ Sec. 102-A, Public Law 759, 81st Cong., 1st sess., August 24, 1949 (64 Stat. 699, 720).

¹⁰ Senator William F. Knowland, Hearings before the Joint Committee on Atomic Energy on the AEC Fellowship Program, 81st Cong., 1st sess., p. 43.

¹¹ Representative Francis Case, Additional Hearings before the Subcommittee of the Com-

A year later, the National Science Foundation was established. It was provided with authority to grant fellowships in fields of study which included those covered by the Commission's nonsecret fellowship program. An oath and an affidavit but no loyalty clearance were required of fellows in the unclassified field. In the following period, the Commission therefore began to transfer much of its original program to the Foundation—a government agency not saddled with special precautions, because the question of security had been determined on its merits, not on the fact that it was a program of the Atomic Energy Commission.

Noncommunication within the government

In very different areas of the Commission's information control activities, such as the flow of secret information within the government, or the communication of secret information between us and our allies, it has again been the special handling afforded the atom and its secrets that has caused most of the complications.

One can find numerous instances, early and late in the postwar period, where atomic information was regarded as so secret, and therefore so tightly "compartmentalized," that even top officials in the government, military and civilian alike, had no knowledge of it. For example, a wartime agreement in 1943 between the United States and England, not to employ atomic weapons without mutual consent, was kept secret from all members of Congress until mid-1947, when Senators Vandenberg and Hickenlooper first discovered its exist-

mittee on Appropriations, House of Representatives, on the Independent Offices Appropriation Bill for 1950, 81st Cong., 1st sess., p. 69

ence. It was also kept from Secretary of the Navy Forrestal until he was elevated to the position of Secretary of Defense, and then he was informed of it, not by executive officials, but by the two Senators.¹²

There are more recent illustrations. In the spring of 1951, during the MacArthur dismissal hearings, General MacArthur indicated in a reply to a question of Senator McMahon that, although he was Supreme Commander of the United Nations forces in Korea, he did not possess any information about the nature and portent of the atomic weapons tests then taking place in Nevada.¹³ These tests, in fact, marked an important stage in the development of atomic weapons for tactical use on the battlefield.

Barriers to international exchange

These special barriers to communication within the government, however, were minor indeed in comparison to the limitations on any communication of classified atomic information with our closest allies. While military and diplomatic secrets continued to be shared with them after the war, all exchange of atomic secrets, even with our wartime atomic partners, ceased with the passage of the Atomic Energy Act in 1946.

The act prohibited any sharing of restricted data of an industrial or military nature until Congress was satisfied with the adequacy of international safeguards. This provision, however, was enacted before hopes of international control of atomic weapons had faded, and before the mounting hostility of the Soviet Union, and the Soviet atomic explosion, put an entirely new light on

atomic collaboration with those nations which had again become our formal military allies.

The two steps which have been taken in the seven years since the act represent only negligible progress toward establishing a relationship in keeping with the military collaboration we have undertaken in the collective effort to defend the free world. The first step was an executive agreement with Great Britain and Canada in 1948, permitting a rigidly limited exchange of classified information, primarily of a research nature. Even this much exchange of this information was accepted by the Joint Committee largely because the agreement also rescinded the wartime restriction on the use of atomic weapons, noted above, and established a favorable arrangement with England in the distribution of Belgian Congo uranium ores.¹⁴

For the next three and a half years, any move to enlarge co-operation was effectively resisted by Congress, even after the signing of the North Atlantic Treaty. In July 1949, for example, a proposal of the executive branch of the government to explore the possibilities of a new atomic partnership with England and Canada was stopped in its tracks by the categorical opposition of Senator Vandenberg and other Senators.¹⁵

Finally, in the fall of 1951, Congress was persuaded to amend the act to permit the exchange of restricted data with foreign countries, which could include information on reactors and the production of fissionable material.¹⁶ However, no sharing of atomic weapon information was permitted, and, before any ex-

¹² See Walter Millis (Ed.), *The Forrestal Diaries* (New York, 1951), p. 338; Arthur H. Vandenberg, Jr., *The Private Papers of Senator Vandenberg* (Boston, 1952), pp. 359-61.

¹³ McMahon Interview, cited note 3 *supra*.

¹⁴ Vandenberg Papers, cited note 12 *supra*, p. 361.

¹⁵ *Ibid.*, pp. 363-65.

¹⁶ Public Law 235, 82d Cong., 1st sess., October 30, 1951 (65 Stat. 692, 42 U.S.C. 1805)

change whatever could take place, a formidable list of twenty conditions had first to be met, which included a unanimous vote of the Atomic Energy Commission, formal approval of the National Security Council and the President, and a thirty-day interval for Congress to scrutinize the arrangement.

In 1953 there has yet to be any exchange of atomic weapon information abroad, despite the success of both our enemies and our allies in the field. No such data can be shared with our allies, whether it relates to the design and production of weapons or to the very different type of weapon information concerning effectiveness and methods of utilization, and the quantity and types available for the defense of western Europe. It is no conventional relationship among military allies to have all but one of the members kept in ignorance of the capability upon which, soundly or unsoundly, they are greatly relying for their combined military effectiveness.

Public discussion rejected

There is one final illustration of special behavior towards atomic secrets which illuminates both the Commission's declassification problems and the political problems of congressional control and public accountability.

In a speech in January 1949, Senator McMahon addressed himself to the question: "Should we reveal the size of our atomic stockpile?"¹⁷ He did not answer the question; he merely said it must be publicly asked and the issues publicly weighed, so that whatever the answer, it would be a considered one. "Perhaps our military needs absolutely dictate that atomic production figures be kept secret," McMahon continued, but if so, we were risking the "tested

traditional principles of free and constitutional government," and we must be sure that the risk had really been calculated.

McMahon went on to identify the issues. On the one hand, concealment of production figures, even from the Joint Committee, kept knowledge from Congress which it needed to discharge its duties in providing for the national defense, and compelled Congress to purchase an atomic "defense package sight unseen," which might be the equivalent of a large army or merely a regiment. Equally important, without this knowledge, proper Joint Committee appraisal of the Commission was impossible, as was proper public appraisal of the Joint Committee.

On the other hand, McMahon said, disclosure of production data would tell the Russians what they had to do to rival our progress, what damage we could inflict, and what countermeasures they needed. Even the intermediate possibility of secretly informing the Joint Committee had its drawbacks. Since the information could not be reported publicly, the rest of Congress, in voting on the proper size of the defense forces, would be forced to rely purely on the unexplained "say-so" of the Joint Committee members.

A few days after McMahon's speech, President Truman was asked by the press about the desirability of public debate on stockpile disclosure. The President answered with a categorical No, and indicated that no part of this topic was a fit subject for public discussion.

Senator McMahon had thought the country should at least stop and consider the political consequences of existing secrecy and decide whether it was justified. The President, in flatly rejecting such an idea, plainly revealed how dangerous this experiment with atomic secrecy had proved to be. Once

¹⁷ Brien McMahon, "Should We Tell How Many Atom Bombs?" 95 *Congressional Record* A-4051 (1949).

launched, it not only hampered criticism—it defied examination.

Public discussion considered

Within the past few months, however, there have been some signs of a change in the government's approach to this topic, and of a modification in the absolute distinction hitherto drawn between atomic and nonatomic information. In an article published in July 1953, Dr. J. Robert Oppenheimer wrote that while there were secrets important to be kept today, including some in the field of atomic energy,

knowledge of the characteristics and probable effects of our atomic weapons, of—in rough terms—the numbers available, and of the changes that are likely to occur within the next years, this is not among the things to be kept secret. Nor is our general estimate of where the enemy stands.¹⁸

In contrast to the President's prompt rebuff of Senator McMahon's speech in 1949, top officials have displayed a respectful attitude toward the more positive conclusions of Dr. Oppenheimer in 1953. Both Chairman Dean and President Eisenhower indicated that they were not unsympathetic to many of Dr. Oppenheimer's views, and were aware of the importance of the issues. One can conclude, at least, that the issues themselves will no longer be regarded as unfit for public discussion.

THE QUESTION OF UNIQUENESS

These three illustrations, covering a variety of activities and governmental problems, lead to the conclusion that many of the dislocations produced by atomic secrets have not been due to the existence of secrets and security precautions per se, but to the accompanying frame of mind which has led the government to put the problems posed

in a special category outside the orbit of normal security practices.

This, in turn, leads to a deeper question, and one which defines the real issue posed by past behavior. The crucial problem is not whether Congress was right in regarding atomic secrets as unique in their importance, but whether the proper measuring stick has been used to determine this uniqueness, its extent, and its consequences. The mischief has been done as a result of the view that, since the atom is unique, any information relating to it is unique, and therefore justifies, by definition, and without further thought, unprecedented departures from customary behavior.

The expression "atomic secrets" has accordingly been considered as a blanket term covering a single subject, which has been discussed in a collective, undifferentiated sense. It has rarely been considered as a label describing various types of data which constitute, to a greater or less degree, information worth keeping to ourselves, for a variety of important and less important reasons.

Actually, restricted data can be broken down into the same categories of information found in other secret operations. Some of it includes operational facts—what we are doing, what we are planning to do. Some of it is program status information—how many weapons we have, of what types, and how fast they are being produced. Some of it is information on weapon design, on production details, or on scientific techniques. Some of it is information on the characteristics of the weapons, their effectiveness, their method of employment. Some of it is intelligence data—information and sources of information on the status of other nations' progress. These are all traditional categories. Similarly, the various reasons for concealing restricted data are traditional reasons—to avoid helping potential enemies to rival our progress, and to

¹⁸ Oppenheimer, cited note 4 *supra*, p. 532.

avoid telling them our accomplishments, our difficulties, and our plans.

The failure to distinguish between different types of information has obscured the basic point that a given type of atomic secret may have more in common with its counterpart in other secret government operations than it has with other types of atomic information. As a result, few have asked the kind of question that needs answering. For example, what are the differences, in nature, importance, and appropriate methods of handling, between top secret information on atomic bomb design, stockpile, or effectiveness, and similar top secret information on guided missile design, stockpile, or effectiveness?

Perhaps there are differences, but unless there are, one may legitimately question why Congress is informed more about guided missiles than about atomic bombs. Since we have found special barriers to communication and special precautions hampering, we should do well to avoid them wherever possible, and to demand no more barriers and precautions than are regarded as sufficient for nonatomic government secrets of the same security classification.

SPECIAL FEATURES

At the same time, the salutary impulse to bring the atom "down to size" and to relate its secrets to others in the government should not lead to the equally false conclusion that there is nothing special about the atom and its secrets. This conclusion has been the source of much ineffective criticism. Even highly informed critics too often recommend that damaging secrecy in atomic energy could be minimized by limiting secrecy to the final weaponizing stages, as it is limited with aircraft, artillery, and other military gadgets.

Such use of the analogy of atomic op-

erations to conventional military operations is likely to be unrealistic and unhelpful. The production of steel for a new gun does not correspond to the production of fissionable material for an atomic bomb. One is an essential but rudimentary process; the other is 80 per cent of the job of constructing the finished weapon. In atomic energy, a sharp line cannot be drawn between the preliminary processes and the final product, or between peacetime and wartime applications. Even between basic scientific discovery and its technological application, the line may no longer be clear. With regard to the last couplet, the virtual elimination of the time lag between discovery and its application, in the past decade, has produced a new situation, with new secrecy considerations. It is a fact that we would be unwise to ignore in an atomic weapons race.

In the political field of policy decisions in atomic energy, analogies may also be misleading. One may argue that major atomic decisions, like other major decisions in the past, involving basic moral, political, and international considerations, should receive the type of public debate through which government by consent is traditionally maintained. Perhaps this is true, but in the case of the atom and in the course of the cold war there have been genuinely new and ambiguous circumstances that demand a fresh evaluation. Many of the major atomic policy decisions have raised policy issues which are intermeshed with technological details and with facts of program status and international cold war strategy, much of which is properly considered highly classified information.

One would be just as unwise to conclude that the atom has raised no new problems of secrecy as to conclude that all its problems are essentially new. What seems to have totally escaped us,

however, is a third conclusion which the eight-year experience should have made plain. While there are genuinely new problems posed by atomic secrecy, and occasions where departures from precedent in coping with them are justified and important, these problems and these occasions are identified by an open-minded examination, not by a blanket assumption or a definition. The proper response to the position that atomic secrets merit unique protection is not a denial but a series of questions and a demand to be shown.

THE DEMOCRATIC PROCESS

This analysis suggests that the significance of the atomic secrecy experi-

ence can be defined in rather basic and inclusive terms. The atom and its secrets led to the temporary capitulation of a democratic society to the apparent demands of an apparently important subject. In the process, that society failed to reserve to itself the capability of putting any departures from custom, which it imaginatively decided to make, to the irreverent test of justifying themselves in operation. It is by this process, in the past, that the most unknown and frightening subjects have been made familiar and have been effectively assimilated. In the complicated present, we should do well to remember and apply this great resource of a free society.

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Personnel Security

By RALPH S. BROWN, JR.

IN view of the obsession with secrecy in the atomic energy program, the measures that have been taken to exclude poor security risks seem surprising mild. The Atomic Energy Commission's policies and procedures are cut from the same general patterns that are in use throughout the federal establishment by agencies bearing a far lighter burden of concealment.¹ In the most general terms, personnel security contemplates the rejection of anyone whose employment potentially endangers the "common defense and security"—a recurring phrase in the Atomic Energy Act.

To protect the "common defense and security" against harm from employees requires, of course, more than the keeping of secrets. The employee may also commit sabotage, either in the classic way by wrecking the machines, or more subtly by wrecking the administration. He may even hopefully be lying in wait for the revolution when he will try to seize a key installation and hand it over to the enemy. Such threats of careless or faithless behavior are the proper subject matter of security measures. But the statute and the course of events have combined to emphasize, if not to over-emphasize, the single threat of espionage.

STATUTORY EMPHASIS ON KEEPING SECRETS

In the act the mandate for personnel screening is found in Section 10, on "Control of Information." At the heart of that section lie drastic criminal sanc-

tions, supplementing in an intricate way the general Espionage Act. They are directed against anyone who discloses or otherwise misuses "restricted data." "Restricted data" is a statutory catch-all to encompass any information about atomic weapons and fissionable material, except what the Commission decides can be published without "adversely affecting" the overworked "common defense and security."² Only after threatening malefactors with a death penalty does the statute go on to lay down preventive measures. No contractor's employee may have access to "restricted data" unless the Federal Bureau of Investigation has investigated his "character, associations, and loyalty" and the Commission has cleared him. A similar FBI investigation is required for all employees of the Commission itself.³ Language in another punitive provision of Section 10 has some bearing on sabotage;⁴ but one gains the impression that these phrases, along with the personnel screening measures just described, are but reflections of Congress' anxiety over the secrets of the atom.

ATOMIC ESPIONAGE

While the Atomic Energy Act was still under consideration, the revelation to Canadian authorities by a Russian code clerk of the operations of an elaborate spy ring led to the arrest and prompt conviction in March 1946 of Dr. Allan Nunn May, an English nu-

² Sec. 10 (b) (1) and (2).

³ Sec. 10 (b) (5) (B) (i) and (ii).

⁴ "Whoever . . . mutilates, or destroys any . . . instrument, appliance . . . incorporating restricted data . . ." Sec. 10 (b) (4).

¹ See generally Eleanor Bontecou, *The Federal Loyalty-Security Program*, Ithaca: Cornell University Press, 1953

clear physicist, for reporting to the Russians what he knew about our own as well as the British and Canadian installations. The House of Representatives, during debate on the bill, was especially alarmed by the exposure of the Canadian ring, and by vague rumors of leaks from Oak Ridge.

For the next three years tension was maintained by a series of dramatic but on the whole insignificant exposés. The House Committee on Un-American Activities uncovered some Communists among scientists who had worked on the wartime atomic projects, and developed some evidence of contacts with Russian agents. One George R. Jordan, who had been stationed at the Great Falls, Montana, air base from which air freight went to the Soviet Union, produced some lurid "diaries" describing shipments of uranium and classified documents. In due course it was established that some uranium was sent on lend-lease requests so as not to alert the Russians to our unusual interest in that metal. Jordan's other allegations appear to have been equally unsubstantial; but they served to keep the pot boiling.

Similarly, in the course of the major investigation of the Commission by the Joint Committee on Atomic Energy in 1949, Senator Hickenlooper and the press made a great deal of uproar about the disappearance from the Argonne Laboratory of about an ounce of uranium 235, which was later retrieved from a scrap heap. This incident demonstrated "how easily the American public could be frightened and their alarm turned to political mischief."⁵ Part of the "political mischief" of the 1949 investigation was a further charge by Senator Hickenlooper of softness in

the personnel security program, which the full committee found to be unsubstantiated.

Of far greater gravity than all the other spies and spy stories put together was the case of Klaus Fuchs. The most sober estimates have it that this German-born, English-naturalized physicist by his betrayals advanced the Soviet program at least a year. His confession in early 1950 was followed by further shocks: the FBI closed in on Harry Gold, courier for the principal espionage apparatus in the United States, and, through him, on David Greenglass. A technician and not a scientist, Greenglass confessed that he had been able to communicate important details of bomb construction from his Army job at Los Alamos. He and Gold implicated the obdurate Rosenbergs. The long legal and propaganda struggle to prevent their execution kept the perils of atomic espionage in popular view until the death sentence was carried out in June 1953. Meanwhile, Bruno Pontecorvo, another top-ranking British physicist of Italian origin, disappeared with his family in September 1950; it seems to be officially presumed that he is in the Soviet Union.⁶

COMMISSION'S COURSE UNDISTURBED

When one considers the development of the AEC security program against this history of grim reality and irresponsible charges, the remarkable conclusion is that the Commission seems to have proceeded steadily in the direction of giving the employee an opportunity

⁵ The best survey of all these episodes is U. S. Congress, Joint Committee on Atomic Energy, *Soviet Atomic Espionage*, Joint Committee Print, Washington, 1951; see also Joint Committee Report, *Investigation into the United States Atomic Energy Commission*, 81st Cong., 1st Sess., Rept. 1169, Washington, 1949, pp 1-2, 57-79. Cf. Ralph E. Lapp, *The New Force* (New York: Harper & Bros., 1953), pp. 213-16.

⁶ See James R. Newman, "The Atomic Energy Industry; An Experiment in Hybridization," *Yale Law Journal*, Vol. 60 (Dec. 1951), p. 1325, n. 123.

to clear himself. From the Manhattan Engineer District it inherited what may be described as rough-and-ready personnel security methods.⁷ Its own procedures were arbitrary, and its standards not clearly formulated, until the period 1949-50. Then, just as it was under public attack for softness in not dismissing employees, and just as the hammer blows of the 1950 revelations fell on a frightened public, the Commission carried through a series of reforms. There has been no announced major alteration in the program since that time.

Two hypotheses may be suggested why the Commission was able and willing to move against the seeming tide of alarm and opinion. First, none of the substantial derelictions was its responsibility. Either they occurred during the period of Army control, or, as was the case with May, Fuchs, and Pontecorvo, the offenders were certified by the British to be eligible for whatever access they had to our operations. Second, the Commission and its staff were responsive to those critics (scientists' committees and others) who were quietly pressing the unfairness of the rough-and-ready procedures.

AEC STANDARDS AND PROCEDURES

The "Criteria for Determining Eligibility," adopted by the AEC in 1949,⁸ established two categories. Category (A) includes conduct and associations which in themselves establish a presumption of risk; category (B), those which must be "weighed"—presumably against all other information available on the individual. The first category includes—aside from such obvious disqualifications as a record of attempted

espionage or of serious disregard of security regulations—membership in subversive organizations, as identified by the Attorney General, or advocacy of violent revolution. People whom the FBI could ascertain to fall within this category would be unlikely to aspire to employment in a sensitive agency like the AEC.

Category (B) includes some criteria of a nonpolitical character, such as inability to safeguard restricted data, and homosexuality. But most of it takes the investigators and the Commission into the shadowy world of "sympathetic interest in . . . subversive political ideologies," "identification with an organization known to be infiltrated . . .," and "close continuing association with individuals . . . who have subversive interests and associations."

These criteria do not differ in scope—though there are marked variations in form and arrangement—from those that were promulgated by other sensitive government agencies, or from those now applicable to the whole executive establishment by President Eisenhower's transformation of the employees' loyalty program into a security program. It should be noted that his Executive Order 10450 does not trench upon the security operations of agencies like the AEC with a specific statutory mandate.

The administration of the program is nominally decentralized. Authority to grant clearance in the normal case, where no derogatory information appears in the investigative report, is delegated to the Managers of Operations. But only a suggestion of doubt is required to put the case in the hands of the Security Division in Washington. Either Washington or the local security officers may require further investigation or interview the employee. If substantial doubts remain, an opportunity is afforded for a hearing before a three-man board, preceded by a statement of

⁷ See Walter Gellhorn, *Security, Loyalty, and Science* (Ithaca: Cornell University Press, 1950), p. 81.

⁸ Reprinted in Gellhorn, *op. cit.*, pp. 238-44.

the derogatory information "as specifically as security considerations permit." The board does not decide the case; it makes recommendations to the manager, who, in making his decision, is enjoined to consider the effect of a denial on the atomic energy program. An appeal lies to a Personnel Security Review Board in Washington. It in turn makes recommendations to the General Manager, who acts finally for the Commission.⁹

All these administrative arrangements are again quite similar in outline to those of the military and other departments that have similar responsibilities. The chief superficial difference is that most AEC cases necessarily involve not its own staff, but contractors' employees needing access to restricted data. This is so simply because the latter are at least ten times as numerous. The magnitude of the Commission's concern with the politics and associations of persons nominally in private employment is in direct proportion to its remarkable reliance on private contractors.

A BALANCE SHEET OF THE AEC PROGRAM

We have now considered the statutory basis for the Commission's personnel security program, with its emphasis on safeguarding secrets. The development of this program, we have observed, has been one of orderly evolution, and does not appear to have been deflected by the shocks and alarms of atomic espionage. That evolution, in its major aspects, has paralleled the growth of other security programs in the national government. It is now appropriate to attempt an audit of the assets and liabilities of the AEC's record

ASSETS

1. The Commission, since September 1950, has made its hearing and review procedures available to applicants for employment. No other federal agency does so for its own employees. This practice is desirable from the government's standpoint, because a hearing often overcomes doubts raised by an FBI dossier. Thus the government is not needlessly deprived of a man it wants. From the employee's standpoint, the opportunity to clear himself of an imputation of disloyalty is obviously desirable. The main objection to giving applicants hearings seems to be the administrative burden. The AEC has borne it with satisfactory results.¹⁰

2. The Commission has maintained a high-caliber independent review board. If, as is reasonable, initial hearing boards are recruited from the staff and sit at locations convenient for the employee, they may be competent, or they may not. The awesome task of a security board is, in the absence of automatically disqualifying factors, to appraise the whole man. On the basis of his total history and personality, is he a good risk? Sometimes the man may be bigger than the board. A judgment by Lilliputians needs to be reviewed.

Elsewhere in the government the composition and performance of review boards, to the limited extent that they can be appraised, have been spotty; and the trend seems to be to dispense with them.

3. The Commission claims to have exhibited restraint in requiring formal hearings prior to clearance. A hearing, though an important privilege for the employee, is nevertheless an ordeal. The Commission report attributes the low number of formal hearings to the

⁹ The hearing and review regulations are reprinted in Bontecou, *op. cit.*, pp. 341-48. For the internal procedures, see the Commission's release accompanying the hearing and review regulations, Sept. 19, 1950, and its current General Manager's Bulletin 80.

¹⁰ Atomic Energy Commission, Fourteenth Semiannual Report (Washington: Government Printing Office, July 1953), p. 71.

fact that informal interviews with the employee are extensively used, and often serve to "eliminate doubt."¹¹ Some security staffs avoid like the plague the one informant who knows most about the case—the employee himself. Others misuse the interview as a lever to force the employee to resign. The AEC approach is clearly superior.

4. On the asset side must also be put the recent abandonment of the routine use of the lie detector at the Oak Ridge production plants.¹²

LIABILITIES

1. The strongest criticism that is leveled at all federal loyalty and security programs, AEC's included, centers on their reliance on unidentified informants who cannot be examined before the hearing board. This routine denial of confrontation is itself justified on security grounds (undercover sources must be protected), and, less vigorously, on grounds of administrative convenience (the employee knows what he has done and said, so let him establish his trustworthiness). The difficulty and unfairness of making a man prove that he has *not* had subversive associations, when he is unable to challenge the informant who says that he has, are obvious. The convenience argument is in-

defensible. In an activity that is a target for penetration by spies, there is some force to the security argument, but it is often overplayed.

However, the right to confrontation has no present effective official (or judicial) support in the case of government employees. The author believes that the legal case is stronger when government control of private employment is in question; there, questions of due process of law are still open.¹³ This approach might be pertinent for some contractor employees; it would depend on the gravity of excluding a man from access to restricted data. In the case of a casual construction worker, the denial of clearance might be of little import; in the case of a nuclear physicist, it could blight his career.

2. Another common failing of security programs is that they cast their net too wide. The strict statutory definition of "restricted data" is initially responsible for the unduly large number of employees who must be investigated and cleared. The Commission compounds this liability by intense physical security measures resulting in far-flung "exclusive areas" and the like. People working in these areas must also be cleared. As a result, scientists whose proposed research is entirely open and who are abstractedly incurious about official secrets may have to run the gantlet if they are to work at Brookhaven or Oak Ridge.

The statute is further at fault in requiring a full FBI investigation of all Commission employees and all contractor employees with access to restricted data. The result is expense and delay in having full field investigations, hearings, and so forth, for people who in fact learn nothing on their

¹¹ AEC, *op. cit.*, p. 70. The statistical material which is presented to support the claim of relatively few formal hearings (there have been 287) is not exactly comparable with any other published figures. The report states that out of about 400,000 investigations, derogatory information has appeared in 4,000, mostly on applicants. "Slightly more than half" of these cases were not carried to a conclusion. This large proportion of unresolved cases may variously reflect (1) the unavailability of hearings for applicants before September 1950, (2) unwillingness of employees to wait for or to face a decision, (3) transfer by the employer to unrestricted work, or (4) circumvention of the review procedure by dismissals before adjudication.

¹² *Ibid.*, pp. 71-72.

¹³ See Brown and Fassett, "Security Tests for Maritime Workers: Due Process Under the Port Security Program," *Yale Law Journal*, Vol. 62 (July 1953), pp. 1191-1200.

job that "would be worth a glass of vodka in Moscow," as the respondent in one Army security case put it.

The Commission has been trying to get congressional permission to use its discretion and check names and fingerprints against security files without doing more. This reform would cut down the investigative burden for the Commission and for the 99 per cent of the applicants on whom there is nothing derogatory anyhow (in the security sense; routine name checks turn up a lot of other unemployables). It would make the mesh of the net a little coarser; but the cast would be as wide as ever.

Questionable decisions

3. One's acceptance of security programs as a necessity of the times needs to be jarred by the occasional reading of a transcript of a hearing. The author has had the privilege of examining two recent AEC cases. One was a young chemist who wanted the job; he was denied clearance. The other was an outstanding research man whom AEC wanted; he was finally granted clearance after appealing a denial to the review board; he then turned down the job. The two cases are much alike in their deplorable aspects, and have many parallels in other cases from other agencies; but it should be repeated that these aspects are reported from only two recent AEC cases.

Decisions in both cases were unduly delayed. The time span from the firm offer of the position to the final termination of the case was, in each instance, more than two years. In both of them many months passed between the initial hearing and the notification of denial.

Both cases involved courteous but extensive questioning about the applicants' private beliefs, both political and religious. The apparent intent was to

look for parallels to Communist lines. The result was a rather pointless and, one should suppose, painful probing.

Another touchstone for the board (and for the AEC counsel assisting the board) was epitomized by a ground on which denial of clearance was based in both cases: unwillingness to recognize Communism as subversive (or as a "threat to the security of the United States"). All that this means, in the author's opinion, is that the applicants did not exhibit the currently correct degree of anti-Communist fervor. Does this justify an inference that they are likely to become spies or traitors?

4. Just as a pathologist may come to believe that disease is everywhere, so security officers are prone to suspect Communists under every cabbage leaf. This excess of zeal leads to occasional absurdities—or outrages, depending on the observer's boiling point. On the evidence to date, the exclusion of a Member of Congress, R. L. Condon of California, from one of the Nevada weapons tests in May 1953 was inexcusable.¹⁴

5. There is one peculiarity in the AEC's relations with its contractors that it has never explained, satisfactorily or otherwise. The Congress of Industrial Organizations has complained of a practice of turning over to the contractor-employer investigative information that is unfavorable but not substantial enough to warrant further proceedings by the AEC.¹⁵ These are known in security jargon as "invite" cases, and the question inevitably arises, what is invited? Unceremonious dismissal by the employer? It appears that the Commission has restricted the freedom with which this information was formerly conveyed, but there is no indication

¹⁴ See *New York Herald-Tribune*, July 6, 1953, p. 1; *New York Times*, July 15, 1953, p. 13.

¹⁵ Newman, cited note 5 *supra*, p. 1385.

that it has either abandoned the practice or justified it.

ASSET OR LIABILITY?

The author is uncertain whether the Commission's security policies with respect to labor unions and their officials should be entered as an asset or a liability. The Commission has taken a stiff position that it has the power to forbid its contractors to bargain with unions it deems to be Communist-dominated (notably the United Electrical Workers, expelled from the CIO), and to investigate the loyalty of union officials who exercise any authority over employees working on restricted projects. In a legal challenge to the exclusion of UE from atomic energy installations, the Commission was upheld in 1949.¹⁶

General provisions from the Atomic Energy Act about the Commission's and its contractors' security obligations are adduced in support of these firm measures against left-wing unions. Doubts arise not so much about their legality as about their consistency with whatever national policy has developed on the touchy issue of left-wing unions. The AEC has rushed in where the Department of Defense and the Congress have feared to tread. There has been protracted agitation, but as yet no legislation to supplement the ineffective oath requirement of the Taft-Hartley Act. The AEC's actions may turn out to have been only premature, and not unwise.

STRIKING A BALANCE

The chief gain from the personnel security operations of the Commission is the absence, *as far as we yet know*, of any defections among its people. This

¹⁶ *United Electrical, Radio and Machine Workers of America v. Lilienthal*, 84 F Supp. 640 (D. C. 1949); see Newman, *op. cit.*, pp. 1383-88.

means more than the keeping of "secrets." Confidence that every reasonable measure is being taken to ensure the integrity of the organization must also make for smoother operations. The Hiss case and, especially among scientists, the Fuchs case left their mark in a smear of mistrust. It is a pathetic commentary on our times that many of us need the tacit assurances of a vast security apparatus before we can wholly rely on the loyalty of fellow workers. These are unverifiable observations, but who will deny them?

The chief loss to the nation is the talents of those who were, but need not have been, excluded from the Commission's service, and of those who refuse to consider it because of the hazards and indignities of screening. In the long run, the greater loss may fall on the individuals who have willingly or unwillingly adjusted themselves to the standards of the security officer. To have to account for, to extenuate, to recant associations and sympathies that were in no way illegal is degrading; but that is what is required of those whose views have inclined toward the left of the political spectrum.

Is there any preferable alternative? The AEC is a high-priority target for espionage and sabotage.

You can have all the guards you like; you can put all the barriers around the plant that you like; but if the people involved in carrying out your programs are not loyal persons, you might as well not bother to put up the alarms, to put up the fences, and to hire the guards.¹⁷

Mere physical security is not enough.

The wartime program, while it was drastic in packing off those who talked

¹⁷ Tyrone Gillespie, chief security officer, Dow Chemical Co., "Security Maintenance in Industrial Enterprise," in Michigan Summer Institute, *Atomic Energy Industrial and Legal Problems*, Ann Arbor, 1952, p. 200.

to the wrong people, took successful chances on some leftist scientists who could not conceivably be cleared today. But they were totally unsympathetic to our then enemies, so the parallel fails. Besides, it is said that the Army kept such persons under surveillance. Being shadowed is not particularly preferable to passing a loyalty test.

In the search for alternatives, proposals have been made for more expert appraisals of the man, and for less burrowing into his politics in the 1930's. If the security judgment were absorbed into the general assessment of suitability for the job, then, it is argued, the stigma of a security denial would disappear.

Perhaps—doubtless—the tests could be improved. But the issue of past

politics and associations cannot be ignored, so long as it is recalled that Fuchs had been a Communist in Germany, and that the Pontecorvo family in Italy includes some Communists. And as for the formality and the finality of the present procedures, it should also be recalled that they were evolved to aid, not to oppress, radicals. They were required because when appraisals were informal the security issue was decided arbitrarily by the security officers. Because the omnipresent question of loyalty goes to a man's character and his future, because it is entangled with issues of free speech and free thought, it is of a different order from decisions on competence and personality. It cannot be decided by officials to whom security considerations are overwhelming.

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Some Attitudinal Consequences of Atomic Energy

By ELIZABETH DOUVAN and STEPHEN B. WITHEY

AN alert visitor to the United States might well arrive at the conclusion that atomic energy, in one form or another, is a primary focus of attention for members of our society. The broad area is accorded extensive coverage in our newspapers and magazines. Titles of public lectures, books, and articles on quite unrelated topics often include the phrase "in the atomic age." The inquisitive visitor would find frequent references to atomic energy in motion pictures, radio dramas, comic books, popular fiction, and a great number of other sources. He would have substantial evidence for his conclusion.

The social scientist might well draw a similar inference from these data. The mass media and channels of folk expression may be viewed as a screen on which public interests are projected, or as a set of stimuli almost continuously confronting the public. Either view would lead to the conclusion that the position of a subject in the mass media must be related in some meaningful way to the position it has in popular attitudes and thought.

Empirical studies of attitudes toward atomic energy reveal a different picture. In general, it may be concluded from these studies that this new phenomenon has strikingly *little* place in the conscious life of the American people. In contrast to the quantity and variety of consideration it has received in the mass media, the role of atomic energy in public opinion appears narrow and stereotyped.

EXTENT OF KNOWLEDGE

Consider first opinion regarding the atomic bomb and atomic warfare—the

most sensational and most publicized application of the broader discovery. Virtually every adult in the United States *has* heard of the atomic bomb. As far back as the time of the Bikini tests, less than 2 per cent of the population had not heard of it.¹ Such a finding is not commonplace. No other event in national or international affairs has registered so broadly in public awareness. "People who have never heard of the United Nations and have neither interest in nor knowledge of world affairs know that a new and tremendous force has been discovered."²

When we move beyond this minimum knowledge of the existence of the bomb to questions involving greater information, the number of informed respondents decreases substantially. In 1950³ and 1951⁴ approximately two out of three urban residents reported having read or heard something about the effects of atomic bombs "in the last year or so." About the same proportion had heard of "radioactivity or atomic rays or something like that in connection with the bomb."⁵ Since at the time of these studies there was considerable information available about radiation and

¹ *Public Reaction to the Atomic Bomb and World Affairs* (Ithaca: Cornell University, 1947), p. 89.

² Sylvia Eberhart, "How the American People Feel about the Atomic Bomb," *Bulletin of the Atomic Scientists*, Vol. 3, No. 6 (June 1947), p. 146.

³ *Public Thinking about Atomic Warfare and Civil Defense* (Ann Arbor: Survey Research Center, University of Michigan, 1951), p. 130.

⁴ *The Public and Civil Defense* (Ann Arbor: Survey Research Center, University of Michigan, 1952), p. 61.

⁵ *Ibid.*, p. 65.

other bomb effects, we may assume that the fact that a third of the sample had heard nothing of them is a reflection of lack of interest rather than lack of opportunity to learn.

Level of information is another index of interest in a subject. It requires greater interest in a field to obtain adequate and accurate information than to be able merely to report having heard "something." Only one out of five urban dwellers has a realistic conception of the effects of an atomic bomb explosion.⁶ Half the population has conceptions which can be classified "exaggerated" or "highly exaggerated." Another fifth of the population will not venture a guess as to the effects. When asked what materials are used in making an atomic bomb, less than a third can give an even partially correct answer.⁷

EXPRESSED UNCONCERN

Since the atomic bomb is a threatening phenomenon and since the general tendency is to exaggerate its destructiveness, one might expect that people would be quite worried about it. The data available do not, however, bear out this expectation—at least if we consider conscious worry which people are willing to discuss.

In 1946 half of the American people said they were not worried about the atomic bomb. Only one out of every eight individuals spoke about deep personal concern.⁸ The atomic bomb cannot, of course, be viewed outside the context of international tensions, and it is true that in 1946 relations between the United States and the Soviet Union had only begun to deteriorate.

However, as late as the fall of 1950, when people were asked if there were

anything in the national or international situations which worried or disturbed them, only 1 per cent spontaneously raised the issue of the atomic bomb, although a substantial group referred to the possibility of war as a source of concern to them.⁹ In 1952, when international tensions were extreme, 40 per cent of the employed people of Detroit said that they were not personally concerned, even though in this case the atomic bomb was placed in the context of war threat.¹⁰

Is this verbal nonchalance concerning the bomb the result of differentiated thinking about the problem and a conscious judgment that the situation does not demand worry? Do people hold optimistic attitudes about world affairs which would logically justify this lack of concern? Our data indicate that such is not the case.

BELIEF IN CONTROL OR MONOPOLY OF BOMB

For example, the American people are not very hopeful about the prospects for international control of atomic energy. In 1947 only 35 per cent considered the outlook even "fair," and less than one person in seven felt it was "good."¹¹

The idea of a permanent United States monopoly over the bomb—combined with a belief that here the bomb is in safe hands—does not prove to be a widely held source of optimism, either. As early as 1946, between one-fifth and one-quarter of the population felt that

⁹ *Public Thinking about Atomic Warfare*, *op cit.* note 3 *supra*, p. 17.

¹⁰ *The Impact of Atomic Energy on Society*, Survey Research Center, University of Michigan, manuscript in preparation under sponsorship of the university's Phoenix Memorial Fund.

¹¹ National Opinion Research Center survey, reported in Gabriel Almond, *The American People and Foreign Policy* (New York: Harcourt, Brace and Co., 1950), p. 111.

⁶ *Ibid.*, p. 62.

⁷ *Public Reaction to the Atomic Bomb*, *op cit.* note 1 *supra*, p. 28.

⁸ *Ibid.*, p. 96.

some other country might already have the information necessary to build the bomb, and only 2 per cent held such ethnocentrically secure views about science as to state categorically that "no other nation will be able to make it."¹² There is no reason to believe that the experience of the last seven years—including the announcement of the Soviet Union's atomic tests—has increased the proportion of the population which relies on the notion of monopoly as a source of comfort in the face of the atomic bomb.

WAR EXPECTANCY

On the question of the American people's expectations of war or permanent peace, the results of opinion surveys are somewhat unclear. Shifts and incongruities appear in the data, which may be explainable on the basis of question wording changes—an important factor in areas where opinion is uncrystallized. However, relatively cautious generalizations may be made.

The fact that the American people want and hope for peace is reflected in a survey conducted at the time of the first Korean peace talks (August 1951). Despite the flow of warnings issued to prevent overoptimism concerning the truce talks, 56 per cent of the residents in major metropolitan areas reported that they felt more hopeful for peace at that time than they had prior to the opening of the talks.¹³ There is evidently a readiness to accept even small signs as a basis for hope.

However, the general level of war expectancy remains high. The percentage of people expecting war in the next ten years was very large (74 per cent) by March 1948, and had been steadily ris-

ing since March 1946.¹⁴ The proportion of urbanites expecting another world war in "the next year or two" was 51 per cent in 1950 and 32 per cent in 1951.¹⁵ Even when the time perspective is so short, there are fairly large groups who take the pessimistic view that a world war will occur. Optimism about peace cannot be the keystone for widespread unconcern about atomic warfare.

ADEQUACY OF DEFENSE

A more generally held support for such unconcern lies in the belief that the government has the ability to provide adequate protection against an atomic attack. In 1946, 40 per cent of the population expressed the opinion that the United States would work out a defense before other countries could make the bomb.¹⁶ Despite pessimistic official pronouncements on air defense potential, by 1950 about 50 per cent of the residents of major United States cities thought that the military establishments of our country would be able to provide "complete protection" or "prevent heavy damage" to our cities in the event of atomic war. This figure had increased to 68 per cent by the following year.¹⁷

In view of frequent warnings by authorities that defense would at best be partial and is at present almost nonexistent, this seems an unstable foundation for statements of lack of concern about the atomic bomb. And considering the population's own pessimism about international affairs, it seems safe to conclude that verbal statements of lack of worry do not reflect well-developed, highly differentiated thinking

¹⁴ Almond, *op. cit.* note 11 *supra*, p. 91.

¹⁵ *The Public and Civil Defense*, *op. cit.* note 4 *supra*, p. 7, and *Public Thinking about Atomic Warfare*, *op. cit.* note 3 *supra*, p. 40.

¹⁶ Eberhart, note 2 *supra*, p. 148.

¹⁷ *The Public and Civil Defense*, *op. cit.* note 4 *supra*, p. 12.

¹² *Public Reaction to the Atomic Bomb*, *op. cit.* note 1 *supra*, p. 105.

¹³ *The Public and Civil Defense*, *op. cit.* note 4 *supra*, p. 9.

about the bomb. Little logical structure appears at the foundation of these statements.

ILLOGICAL AND UNSTABLE THINKING

An inspection of the reasons people offer for their indifference lends support to this conclusion. In an early study, less than one in five of the respondents who described themselves as "not worried very much" or "not worried" about the bomb gave reasons which implied that there was no danger in it for people in this country. "Half the people who say they are not worried indicate a recognition that the bomb is a threat—often that it is a very grave threat."¹⁸

In a more recent study in Detroit, less than 40 per cent of those who said that they felt no concern about the possibility of atomic war gave reasons which were logically consistent with a feeling of security.¹⁹

Lack of structure not only describes the attitudes of those who say they are not worried, but is a characteristic discernible throughout public opinion toward the bomb. A report of one national study cites the following examples:

A large group of people argued in the survey that the development of the bomb had made peace easier to keep rather than harder, because other countries were afraid of it and would not dare to provoke a war with us. Many of these same people, in answer to the direct question, declared freely that other countries would probably develop the bomb within a relatively short time. The information they had apparently absorbed had not shifted our monopoly of the bomb from the central position it occupied in their thinking.

¹⁸ *Public Reaction to the Atomic Bomb*, *op. cit.* note 1 *supra*, p. 99.

¹⁹ *The Impact of Atomic Energy on Society*, *op. cit.* note 10 *supra*.

Most of the people who opposed turning the secret over to the UN had expressed the opinion, just before, that other countries could develop the bomb fairly soon; yet many of them made no acknowledgment of the bearing of that probability on the question of UN control of the bomb.²⁰

There are individuals who think there is danger of American cities being subjected to atomic attack, who nevertheless say there is no need for civil defense preparations. On the other hand, there are many who do not admit such a possibility but feel rather urgently that preparations should be undertaken. Finally, there are those who think their city should take immediate preparatory steps toward caring for survivors of an atomic attack, despite the fact that they think a single atomic bomb would entirely obliterate that same city.²¹ In general, systematic and consistent attitudes toward the bomb have not been evolved.

Further evidence of the unstructured nature of popular thinking about the bomb can be cited. In many questions relating to the bomb we find large proportions of the population—in some cases a third or more—unable to state an opinion or venture a judgment. Only in the case of highly structured questions, where respondents are asked to select from among stated alternatives, is the proportion of "Don't know" responses consistently small.²² There are evidently people who have not thought enough about the topic to have opinions.

In addition to being unstructured, attitudes toward the bomb appear to be somewhat labile. Thus, the proportion of respondents expecting war within a two-year period decreased from 51 per

²⁰ Eberhart, *op. cit.* note 2, p. 148.

²¹ *Public Thinking about Atomic Warfare*, *op. cit.* note 3 *supra*, Chap. 5.

²² See, for example, the studies referred to in footnotes 3 and 4 above.

cent in 1950 to 33 per cent in 1951. The percentage who felt that the armed forces could at least prevent heavy damage to our cities in the event of atomic war increased from 48 per cent to 68 per cent in the same period.²³ Comparable fluctuations are discernible in many attitudes in this area.

The picture of public thinking about the atomic bomb is now relatively clear. We have seen that despite the magnitude of the destructive power represented by the bomb, and the unprecedented publicity it has received through the mass media, its importance is not reflected in the role it holds in the conscious life of the population. There is relatively little known about it outside of simple recognition of its existence and gross conceptions of its destructiveness. A large part of the public reports no psychological involvement in the issues of the bomb and atomic war. Moreover, people's attitudes are characterized by contradictions, lack of structure, and instability. The atomic bomb may be part of the raw material of popular fantasy, but it is not a substantial factor in the day-to-day interests and thinking of the general population.

ATTITUDES TOWARD PEACETIME USES

Before attempting to analyze the factors that account for this peculiar situation, let us look briefly at public opinion toward nondestructive aspects of atomic energy. Since the atomic bomb does not preoccupy people, we would expect the less publicized peaceful applications to play an even less significant role in public opinion. This is essentially what the available data reveal.

The study from which the following findings are drawn had as a major ob-

²³ *The Public and Civil Defense*, *op. cit.* note 4, p. 12.

jective the comparison of attitudes in atomic installation communities with those found in similar noninstallation communities. The nature of the sample required for this purpose limits even tentative generalizations to Americans living in small and middle-sized cities.²⁴

The attitudes of this group include a generally positive evaluation of atomic energy and a recognition of the potential importance it holds for peacetime living. There is, on the other hand, little evidence of strong interest in or information about the topic.

Nearly 60 per cent of the respondents in the study thought that "considering all its uses in peace and war" we would be better off for having discovered atomic energy. Many of the remaining 40 per cent were uncertain rather than negative in their evaluation of the discovery.²⁵ About 75 per cent of the group indicated that they considered atomic energy of *potential* importance, by their responses to the question: "How important do you think it will be for those young people (of high school age) to understand atomic energy?"²⁶

LACK OF INTEREST

Despite this gross recognition of the importance of atomic energy for the future, half of the respondents said that they felt indifferent toward atomic energy information when they came across it in their reading.²⁷ Only about 10 per cent reported discussing atomic energy with family or friends more than "once in a while." Half said they rarely or never did.²⁸ When asked whether there

²⁴ Burton R. Fisher, Charles A. Metzner, Benjamin J. Darsky, *Peacetime Uses of Atomic Energy*, Ann Arbor: Survey Research Center, University of Michigan, 1951, Vol. I.

²⁵ *Ibid.*, p. 87.

²⁶ *Ibid.*, p. 70.

²⁷ *Ibid.*, p. 86.

²⁸ *Ibid.*, p. 66.

was anything about the subject they wondered about (in addition to information they already had), about half of those questioned were "disinterested in further data about atomic energy."²⁹

This last fact gains significance when viewed in relation to the information level of this sample, for we find that the group had very little information about atomic energy. About two-thirds reported having heard of it in connection with something other than the bomb, but their knowledge was fragmentary. One person in five either "denied any impression that there were other uses than the bomb [or] did not report the vaguest concept of even general areas in which atomic energy could be used in peacetime."³⁰ In answer to a question on what atomic energy is or what it is like, about one person in fourteen was able to give an informed response. Almost half the respondents said simply that they did not know.³¹

In summarizing the section of their investigation dealing with information, the authors of this study concluded:

The field of atomic energy seemed to exist as bits of information, varying interests and reactions that related to one or another specific uses, problems, or policies. It clearly did not exist as a rather well-structured phenomenon that fitted within a relatively well-defined area of interest for the overwhelming number of . . . respondents.³²

A question was asked which combined elements of both interest and information: "Do you think that the average person can understand enough about atomic energy to make it worth while for him to read things about it?" About half of the respondents thought this amount of understanding was not within

reach of the average person.³³ Generally, people have meager knowledge of the development, and, in addition, many do not feel that rewards of increased understanding are available to the untrained individual. Under these circumstances it is not surprising that atomic energy, as such, is peripheral to the interests of many Americans.

Attitudes toward peaceful uses, like those relating to the bomb, are characterized by lack of structure and clarity. There is nothing in the picture of opinion toward this aspect of atomic energy to contradict our earlier conclusion that the development lacks salience for the population.

SPECIAL PUBLICS

This conclusion may be less applicable to certain special groups in the population. Attitudinal differences appear among the standard demographic groupings (education, age, sex, or income groups), but they are not unique to the area of atomic energy, and have therefore been excluded from this discussion. We have presented only a general picture of public opinion in the area.

Two populations which have somewhat special associations with atomic developments merit brief attention. The first comprises people living in cities near atomic installations. The study which compared this group to residents of matched noninstallation communities indicated that there were few, if any, differences between the two populations.³⁴ People living in installation areas showed no more fear or susceptibility to rumors than other people; they were neither more informed nor more interested in atomic energy. If anything, they had slightly less interest in the development. The authors of the study concluded that geographical prox-

²⁹ *Ibid.*, p. 69.

³⁰ *Ibid.*, p. 36.

³¹ *Ibid.*, p. 37.

³² *Ibid.*, p. 26.

³³ *Ibid.*, p. 97.

³⁴ *Ibid.*, p. 93.

imity did not ensure the psychological relevance of atomic energy.

A group for which we would expect atomic energy to have relevance consists of those people who work with it—particularly scientists. There is some indirect evidence concerning the effects of atomic energy on the attitudes of this group. For example, the fact that the *Bulletin of the Atomic Scientists* has assumed a political-social character seems to indicate that a change in attitude or a change in expression of attitudes has occurred among scientists.

There have, on the other hand, been very few systematic investigations of this group. A study by Kay and Gitlin³⁶ includes some attitudinal information on a group of scientific and executive personnel of a major atomic project. This group of respondents thought that their own views about atomic energy differed from those of the general population, and in cases where it was feasible to contrast these attitudes with those of a national sample differences did appear. However, these results can only be considered suggestive, since methodological considerations prohibit their generalization.

REASONS FOR THE PARADOX

To return to the attitudes of the general public, we are faced with the problem of understanding the following paradox: While atomic energy—particularly the atomic bomb—of obvious significance for our society and has been broadly publicized, survey results reveal that the general population is uninformed and uninterested and has no clearly structured system of thinking about it. In short, atomic energy does

not, to any great extent, absorb people's conscious day-to-day thoughts.

Fear suppression

A number of psychological explanations are possible. One hypothesis is that fear accounts for this attitudinal complex. If the individual knows of the bomb (as almost all people do), and is very fearful of it, one possible means of defense against this fear is to suppress or turn away from the dangerous topic. This, in turn, would lead to the kind of undifferentiated, contradictory thinking about the bomb which has been observed in public attitudes—both because suppressed fear is disruptive and because turning away from the issue cuts off information. Such a theory holds that verbal statements of lack of concern do not necessarily mean that the individual is in fact free of anxiety.

The theory of fear suppression has been considered by most researchers who have dealt with attitudes in this area. Almond says that "the typical attitude in the United States [about atomic policy], instead of sober calculation, ranges from ironic horror to simple evasion and escapism."³⁷ He gives primacy to the fear-suppression mechanism in his explanation of the primitive state of public opinion toward the bomb.

The evidence indicates that anxiety-motivated suppression is a factor in the attitudes of some individuals. One study demonstrated its existence by means of a projective device.³⁷ In interviews a few people state explicitly that they do not want to think about the atomic bomb because it is too terrible. More often we find people who say they are

³⁶ Almond, *op. cit.* note 11 *supra*, p. 15.

³⁷ Lillian Wald Kay and Ewing J. Gitlin, "Atomic Energy or the Atomic Bomb: A Problem in the Development of Morale and Opinion," *Journal of Social Psychology*, Vol. 29-30, 1949, pp. 57-84.

³⁷ W. A. Scott, S. B. Withey, and D. F. Miller, *Fear of War Catastrophe: A Projective Assessment by Interview Survey*, Ann Arbor: Survey Research Center, University of Michigan, 1953.

not concerned about the threat of atomic war but give reasons for this attitude which are highly fearful and fatalistic.³⁸ In these cases it seems likely that the verbalized indifference indicates a denial of fear, rather than its absence. A recent study has shown that such people are more likely to manifest gross thinking and uncrystallized attitudes about atomic developments than either those who admit their concern or those who have fairly consistent and rational attitudinal bases for their stated lack of concern.³⁹ Fear suppression seems to lead to some of the attitudinal characteristics which we have observed in public opinion.

On the other hand, if fear were the primary reaction of the population, we might expect wild rumors and bizarre ideas to spread easily. Although such ideas exist, successive studies have shown that they are *not* accepted to any great extent by the population.⁴⁰ While fear is one factor to be considered, it is probably not the sole determinant of popular attitudes toward atomic energy.

Impotence

A second factor which seems to diminish the role of atomic events in the conscious lives of people is a widely held feeling of lack of power or competence in such matters. One respondent in discussing this feeling said: "Why should I worry about the bomb. There's not a thing I can do about it except make myself sick. If there's a war or not, bombs or not, the people in Washington decide—not me."

This sense of impotence in the face

of the bomb is probably closely related to fear, but has a significance of its own. It is not without a certain reality base. Atomic energy is a technical matter, and policy decisions regarding it have necessitated expert opinions. More and more such decisions are being made outside the open political arena. It is not surprising that many people feel they can have little or no influence on them. The feeling of impotence—especially combined with the impetus of fear—may easily lead to the person's turning away from the entire topic of atomic energy.

Ambiguity of stimulus

Another possible reason for uncrystallized public opinion is ambiguity in the stimulus itself. Atomic developments are a new class of phenomena. Most people do not understand them. Their irreality is intensified by the remoteness of their consequences. No one yet sees these consequences in his own life; his automobile is not run by atomic power, it has not changed his job, his diet, his house, or his recreation. Even the atomic bomb is remote—the references are to future wars and usually to bombing of distant places.

It is an adjustive aspect of man's psychological equipment that he holds his emotional energy and attention in store for those things which have clear relevance to his life. No normal person can maintain a continuously high level of tension concerning an event which may or may not occur. The obvious remoteness of atomic developments probably plays a part in flattening the public's response to them.

In addition to ambiguity of this kind, stimuli may lack clarity because of contradictory elements. In the case of atomic developments, conflicting authoritative statements have often been

³⁸ *The Impact of Atomic Energy on Society*, *op cit.* note 10 *supra*

³⁹ *Ibid.*

⁴⁰ Fisher, Metzner, and Darsky, *op cit.* note 24 *supra*, p. 58. See also the studies of civil defense referred to in footnotes 3 and 4 above.

made. At one point leading scientists held that no defense against the bomb could be devised, but the military differed. Currently the military places little stock in defensive theories, but scientists are more encouraged. Announcements have been made of atomic explosions in the Union of Soviet Socialist Republics, but authorities have publicly doubted that the U.S.S.R. has the bomb. Predictions on peaceful applications have, if anything, been even less consistent. The reaction of the ordinary citizen may be: when the experts make up *their* minds about what this thing is and what it implies, I'll think about it and react. At the moment it's hard to know what to react to, much less how to react.

Relative importance of factors

It seems likely that all these factors and probably others operate to keep atomic energy at the periphery of people's lives. We can speculate about the relative importance each of them has in attitudes toward different aspects of the problem. It is probable that the fear-suppression hypothesis and the feeling of powerlessness are more applicable to attitudes toward the bomb, while ambiguity is more effective in attitudes toward peacetime uses.

The problem of underlying motivations in this area is at present only a field of speculation. The data are suggestive, but the task remaining is the systematic attempt to establish the motivations and gauge their relative weights in depressing the public's interest in and thought about atomic developments.

THE BROADER EFFECTS

Before closing this discussion, a final point seems appropriate. Any new pub-

lic event may have two levels of effect on people's attitudes. It elicits attitudes toward the specific event, which obviously could not have existed before the event occurred. Second, a new event may change or restructure old attitudes and feelings which were part of the individual's psychological structure before the event occurred. In this discussion we have considered only the former kind of effect—primarily because systematic data are available in this area. This does not imply that it is the most important attitudinal effect of atomic energy.

A number of interesting problems present themselves when we consider the broader effects that atomic energy may have on people's attitudes. One may ask, for example, whether this new discovery has caused an increase in the general level of anxiety in the population. Has the incidence of anxiety neurosis increased? Has people's time perspective changed because of the atomic bomb? Do people look less into the future, and with less optimism, than they did before "the atomic age"? Is the sense of personal powerlessness on the increase in our society?

In another area we may ask how this development has affected attitudes toward science and scientists. Have the scientists become the authoritative figures of our day? Do people feel conflictive about the productions of these men? What kind of behavior do they expect of them?

These are a few of the additional questions which need to be investigated before we are in a position to say what effects atomic energy has had on attitudes. At this stage we know that people are much less interested in and informed about atomic developments and are thinking much less actively about them than we might expect. We can theorize that this apparent indifference

masks fear, or that it stems from other factors in the present situation. The final statement of its meaning, as well as realistic appraisals of the broader effects of atomic energy on attitudes, must await further systematic investigation.

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Scientists Before and After the Bomb

By R. L. MEIER and E. RABINOWITCH

THE Second World War and the atomic bomb have greatly changed the patterns of scientific activity, particularly in the United States. All scientists old enough to remember feel the difference in their bones; and many of them are not very happy about it.

Even before the war, the United States led the world in the output of scientific work, but it was generally acknowledged that the most original researches continued to come out of Europe. The migration of Jewish scholars from Europe tipped the scales.

This has meant more than a mere shift in the geographical distribution of scientists; the typical organizational forms and fundamental attitudes of scientists have been affected. In the past, these forms and attitudes have been a reflection of those long established in Europe, tempered by the lower prestige of scholarship and greater emphasis on practical achievement in America. Now, after the massive double infusion of European theoretical insights and vast American financial resources, science in the United States is largely on its own. It is setting the pace for the world and developing its own type of *homo scientificus*, formed by native ideas and domestic events.

When we compare science and scientists before and after the war, we are thus confronted with a twofold transformation—the change from the leisurely and innocent era “before the bomb” to the feverish and troubled times “after the bomb”; and the change from the deeply etched relief of European cultural tradition to rapidly shifting patterns of American life.

CHANGE IN DIMENSIONS

Easiest to assess is the growth of the profession. There are now 600,000 professional scientists and engineers in the United States, as contrasted with 375,000 before the war. Of these 375,000, approximately 8 per cent were chemists and approximately 1 per cent were physicists. These two groups—the physicists in particular—have been most strongly affected by the change, although a few other branches also have become deeply involved.

Before the war, physicists were mainly engaged in teaching and academic research, most of which had—or seemed to have—no practical implications. In the decade of the thirties, according to Hollis,¹ less than one-third of the new Ph.D.'s in physics took positions in government or industry; the other two-thirds stayed on as teachers in universities and colleges.

Today the several societies affiliated with the American Institute of Physics have 15,000 members, of whom 10,000 belong to the American Physical Society. In other words, the profession has four times its prewar contingent. Yet the number of those whose primary occupation is teaching physics has not increased significantly. The wartime and postwar graduates in physics went largely into research, and most of them carry on this research not in academic laboratories, but in the big installations of the Atomic Energy Commission, in sprawling military establishments such

¹ E. V. Hollis, *Toward Improving Ph D Programs*, Washington: American Council of Education, 1945

as the Naval Research Laboratory, and in rapidly expanding physical laboratories of private industry such as the Bell Telephone Laboratories. The three presently favored branches of experimental physics—nuclear physics, electronics, and solid state physics—all have great practical importance, and much research in these fields is applied research.²

The chemists had spilled over into industry and government even before the war. According to Hollis,³ in the thirties many more Ph.D. degrees were granted in chemistry than in any other field, not excluding education; fully two-thirds of these graduates cut off their ties with academic life upon graduation. In fact, so many Ph.D.'s entered the chemical industry in those years that chemists who had merely a bachelor's degree were often employed only as routine analysts; the wartime mobilization of the chemical industry was needed to move them into positions of professional responsibility. This must be the main reason why the growth of the American Chemical Society⁴ has outpaced the growth of the total number of graduates in the field (which can now be estimated at 90,000).

ECONOMIC STATUS

Expenditures for research and development by American industry, educational institutions, and the government passed the billion-dollar mark in 1943. In relatively slow-moving industries, up to 1 per cent of total sales may now be regularly allocated to research; in industries subject to rapid technological change, the allotment may be 3 or even

10 per cent. Other firms appropriate for research 10 to 20 per cent of their total expenditure for capital investments and replacements. About 2 to 3 per cent of the American military budget has been consistently earmarked for research and development since the end of the war. According to DuBridge,⁵ nonmilitary research expenditure increased from 1940 to 1952 by a factor of four, but military research and development—including the activities of the Atomic Energy Commission—have grown by a factor of forty!

It is now more difficult than ever to separate the grains of "research" from the matrix of "development" in which they are embedded. The National Science Foundation estimates, however, that as much as 40 per cent of the federal funds assigned to "research and development" are being spent for "applied and basic research."⁶ Expenditures for basic research alone are estimated at 7 per cent of the total, or 140 million dollars per year; about one-half of this sum goes as research grants to universities and private nonprofit research institutions.

With so much more money devoted to research and development, and with the much-publicized scarcity of research personnel,⁷ it is striking to find how little scientists as an economic group have profited from the change. Before the war, new Ph.D. graduates in science received \$2,000 to \$3,500, with the academic salaries nearer the lower limit. At present, with the cost of living just

⁵ L. A. DuBridge, "Science and Government," *Chemical and Engineering News*, Vol 30, April 6, 1953.

⁶ National Science Foundation, "Economy and the Federal Research and Development Budget," February 1953.

⁷ National Manpower Council (Eli Ginzberg, chairman of staff committee), *A Policy for Scientific and Professional Manpower*, New York: University of Columbia Press, 1953.

² T. R. Shapiro and Helen Wood, "The New Physicists," *Physics Today*, Vol 6, February 1953.

³ Hollis, *op. cit.*

⁴ The membership of the American Chemical Society grew from 25,000 to 62,000 in the forties, as compared with an increase by only 8,000 in the previous decade.

about doubled, beginning salaries in the science departments of universities are in the range of \$4,000 to \$5,000; in industry, \$6,000 to \$8,000. In other words, industrial scientists have kept only slightly ahead of inflation, while academic scientists have been left slightly behind. Scientists with several years' professional experience have fared even worse. Civil service and the academic promotion system hold their salary increases in check, despite active demand and short supply. Even corporations are developing bureaucratically organized research laboratories with rigid pay scales.

Physicists are the only group of scientists whose average real pay has increased considerably since before the war; and this is mainly due to the fact that many more of them are now employed by industrial organizations. On the whole, it may be said that the increase in prestige, power, and authority of scientists within academic, governmental, and industrial organizations has not resulted in a significant improvement of their real income. Those who control the salaries must feel that, for scientists, income is a lesser motivation than new equipment and plentiful technical help. In that, they are probably correct. At least, a recent survey of the chemical profession has elicited from a considerable majority the expression of satisfaction with their lot.⁸

SECURITY PRECAUTIONS

No report on today's status of scientists in America would be complete without mentioning loyalty checks and security investigations. These are the new "occupational hazards" which affect the enjoyment of a scientific career and the public standing of the profes-

sion. It has been said that the first two associations which the word "scientist" presently evokes in an average newspaper-reading American are "bomb" and "spy." All scientists in government employment have to undergo screening when applying for the job, and often again in the course of employment. The same is true of scientists in many industrial laboratories (firms often prefer to have "cleared" employees "just in case" a secret government contract should come their way), and of the many academic scientists who serve as consultants or visiting investigators in government laboratories.

Despite the safeguards which have been added to the clearance procedures, they remain vexatious and fraught with unpredictable losses of income and reputation. The initial wait for clearance may mean incomeless months and loss of other opportunities; a rejection is a stigma that is difficult to live down, and, at this stage, little if any chance of appeal is provided. Withdrawal of clearance from those already employed—often after years of satisfactory employment—is an even more traumatic experience, despite the possibility of appeal.

Every scientist who works or has friends working at government laboratories knows of cases in which clearance troubles have been caused by entirely inadequate—often outright ridiculous—reasons. After a year or two of worry, and several thousand dollars spent for counsel and witnesses, such cases usually end in reinstatement; but the expenses of the procedure are not reimbursable, and the moral scar may never heal.

When it comes to traveling abroad, scientists, particularly those cleared for secret work, are subject to a special investigation which may delay the issuance of a passport by weeks or months. The difficulties of foreign scientists

⁸ American Chemical Society, "How Well Does the Chemical Profession Utilize Technical Manpower?" *Chemical and Engineering News*, Vol. 30, March 23, 1953

wanting to visit America are another and still sadder chapter.⁹

Whether aversion to this kind of supervision diverts some well-qualified young men—perhaps the ones with the most active minds—from scientific careers, or at least influences their choice of discipline in science, is a matter which deserves study by those concerned with the future of American science.

CHANGES IN ORGANIZATION

In the not very distant past, the ideal picture of a scientific organization was the classical one of the Greek academy—a teacher surrounded by pupils. The leading role in science was played by such “schools.” In biology and psychology, different schools often disagreed in their basic beliefs and engaged in violent arguments. In physics and chemistry, where all theory has long since become subject to immediate and rigorous experimental test, such polemics disappeared around the turn of the century; instead, each group excelled in a special field. Scientists from all over the world came to the Cavendish Laboratory at Cambridge to work on electronic physics under J. J. Thompson, and, later, on nuclear physics under Sir Ernest Rutherford; theoretical physicists traveled to Niels Bohr’s institute at Copenhagen. Other laboratories specialized in atomic spectra, proteins, hormones, yeasts, the pigments of flowers, and the like. Figuratively, at least, a young scientist “sat at the feet of his master,” as Plato once sat at the feet of Socrates.

From the postwar crop of scientists, there have emerged few if any new great leaders. A typical picture of the science organization in the postwar era is that of a crowd of intelligent and competent young men assembled, not

around a master, but around a giant atom-smashing machine—a cyclotron, a betatron, or a cosmotron.

Scientific teams

Large scientific teams appeared in the field at about the same time as the large machines. In the past, most papers in scientific journals were signed by a single author, sometimes by two—usually a professor adding his name to the work performed by his student. Sometimes two scientists associated themselves as equals in a team which stayed together for a long time, like Hahn and Meitner in nuclear physics, or Willsstätter and Stoll in organic chemistry. On the Manhattan Project, when speed of progress was the main consideration, research teams of five or ten were brought together, interchanged, and dissolved at a moment’s notice. They often wondered how the authorship of this or that discovery, or the rights to this or that patent, would later be disentangled. This pattern has not ended with the war. Papers signed by half a dozen collaborators, none of them qualifying as the “senior author,” have become common in scientific literature. The teams created nowadays often cut across the borders of individual disciplines; physiologists or psychologists are associated with physicists or chemists.¹⁰

Postwar research does not seem to have led to those brilliant insights that characterized the research of the preceding decades, but it would be rash to say that the present generation of scientists contains no one of the stature of Rutherford, Pasteur, Gauss, or Emil Fisher. The impression may be due in part to the fact that as soon as an interesting possibility opens up, there are

⁹ See *Bulletin of the Atomic Scientists*, Special Issue, Vol. VIII, October 1952.

¹⁰ G. P. Bush and L. H. Hattery (Eds.), *Teamwork in Research*, Washington: American University Press, 1953

now numerous laboratories willing and able to investigate, whereas before the war there might have been only one or two. As a result, even a major breakthrough may be reported in fragments and small pieces that make the advance less impressive.

Furthermore, such flashes of genius as the gravitation principle of Newton, the periodic system of Mendeleev, the quantum principles of Planck and Bohr, or Einstein's relativity, which suddenly brought order and logic into what had appeared a hopelessly tangled congeries of facts, can come only after a preparatory period in which those facts are accumulated and many vain efforts made to sort them out. A sudden new understanding of the structure of the universe, of the nucleus of the atom, or of the nucleus of the cell, may come at any time; but so far the postwar era has been, above all, a time of rapid expansion of factual knowledge, and has led to more than its share of puzzling and contradictory results.

The meetings of the big professional societies—the American Physical Society, the American Chemical Society, the Federation of Biological Sciences, the American Association for the Advancement of Science—are like anthills to which thousands of ants each bring a pine needle or a small straw to throw on the heap. Every meeting seems to exceed the preceding one in the number of participants and the length of the list of "contributed talks," with the ten minutes allotted to each monitored by an electric clock and enforced by a stern chairman. Serious scientific discussion has become almost impossible at such meetings, where it flourished a decade or two ago. Special conferences, in which only a single topic is discussed by an invited group of scientists, have become the new fashion. Almost every week a conference of this type is being held on one of the American campuses,

or in a resort hotel out of season, in which twenty or fifty scientists interested in a special topic—adrenal hormones or nuclear resonance or smog control—come together to exchange ideas and keep abreast of developments in at least one small enclosure in the vast domain of science.

The research contract

One cannot leave the subject of organization without mentioning the research contract. This device was developed during the war by the Office of Scientific Research and Development. The research contract ties the unpredictable business of research to the regulated functioning of a bureaucracy. It specifies the problem area to be attacked and the amount of funds to be allocated over a period which is often set in advance. A liaison organization is created to supervise the contracts and keep the contractor organization informed regarding the progress of the research. Appraisal and review committees of respected scientists are set up in order to advise whether new proposals should be accepted and old ones extended.

This system has led to the programming of fundamental and applied research to a degree not foreseeable before the war; indirectly, but inevitably, it reduces the exploratory investigations, particularly in directions which are not in the spotlight at the moment. The research contract arrangement has become popular also with industry, municipal governments, and trade associations, as well as spreading throughout the federal government. A major problem in the organization of science at the moment is to establish new forms of contracts and liaison arrangements which would restore to science some of the flexibility and spontaneity that has been lost in recent years.

Camouflaged support

Another sensitive point that makes many scientists uneasy is the "wrong flag" under which much research in the United States is now forced to sail. It was an old story in industrial laboratories that fundamental research projects had to be sold to unsympathetic directors or stockholders as promising direct contributions to the profits of the company. The same phenomenon has spread since the war into much of the government-financed research. A large proportion of fundamental scientific research (in some branches, such as nuclear physics, almost all of it) is financed, directly or through contracts, by the armed services—the Office of Naval Research, the Air Force, and smaller branches of the military.

When this type of sponsorship developed immediately after the war it was considered as temporary, to be soon relieved by the creation of a civilian authority with the express purpose of supporting the national research effort in the basic sciences. (With the advent of the age of cosmotrons and electric brains, the support that universities can give to research has become hopelessly inadequate.) However, even since the birth of the National Science Foundation, after several congressional miscarriages, its appropriations (\$3.5 million in 1952, \$4.75 million in 1953) have been so small that there can be no question of a substantial relief for the military agencies, whose research expenditure is of the order of \$100 million per year.

The services are too realistic to ask the research they support to masquerade as military research; they have sound understanding of the long-range importance of healthy basic science for national strength—military as well as economic and intellectual; but when Congress appropriates large sums for these

military agencies and doles it out to the National Science Foundation, it does so in the satisfaction that it supports "militarily important" research.

The situation is as unhealthy as if the states and municipalities failed to provide funds for the maintenance of public schools, and the military "jumped in," in the recognition that a literate and educated population was important for the quality of future draftees. That the situation is also precarious is illustrated by the recent pronouncement of the Secretary of Defense, that "pure science" should not be the concern of the military, but should look for support outside the Pentagon.

Another example of the same unhealthy situation is that much of basic research in biology is supported in America by funds earmarked for "research on cancer" or "heart disease." Again, it is true that in the long run, any progress in the understanding of life phenomena may contribute to the solution of the cancer problem or to relief of arteriosclerosis; but it is a sign of immaturity of those who hold the purse strings that they cannot be made to support fundamental biological research without a pretense of direct medical benefits.

CHANGE IN ATTITUDES

The psychological outlook of scientists, their attitudes toward their profession and the world, are changing even faster than their economic and social status. Not so long ago, theirs was a small, dedicated group, keeping rather aloof from the rest of the world in what were referred to as "ivory towers" but were more often grimy basement laboratories. They lived in intense communion with their colleagues all over the world—an international fraternity which even wars and revolutions could not altogether disrupt.

The present generation of American

scientists is the first one without first-hand experience of this community. On the other hand, this new and more numerous American-born and American-bred generation shifts much more freely between laboratories and industrial plants, universities and government offices, than was customary of old, and shares much more fully in the affairs and attitudes of the people at large. Some of them, who grew up with the atomic spy scares, restrictions on scientific publication, and curtailed international exchange, may find it easy to look at scientists in other countries as competitors, if not enemies. Scientists of the previous generation (and many of the younger one, since it takes more than one generation to interrupt a tradition!) will never be able to do so. For them, the ideal of the "open world" of science, eloquently restated in 1950 by the great Danish physicist, Niels Bohr,¹¹ remains valid—even if they recognize how incongruous it appears in the age of iron (and paper) curtains.

Scientists of the prewar era did not doubt the fundamental worth and virtue of their avocation. Probing into the mysteries of nature was for them a sublime intellectual adventure, in which there could be no evil. Science at its purest was a disinterested search for truth, and had no relation to daily human affairs; but whatever practical results could emerge from it in the long run were bound to make man wiser and better, and to improve his fate. The short path from the discovery of nuclear fission to Hiroshima has shattered their feeling of remoteness of science from the folly of man's pursuit of power over man, and from the crime of nations warring on nations.

Technology never was so remote from the evils of society as science. Engi-

neers have traditionally built weapons for war. However, in the United States military engineering was so insignificant compared to the technology directed toward the increasing of human welfare that in the past its existence could not affect the American engineer's firm belief in his constructive mission. If science was all goodness, technology was all progress.

This age of innocence is past. Not that the majority of scientists have uneasy consciences because they developed the atomic bomb or prepared for bacteriological warfare. A few may have such sense of personal guilt; but the majority believe that they had no choice—in the same way as a soldier has no choice on the battlefield, or a workman no choice in a war factory. The uneasiness experienced by many of them is born out of loss of belief in the unquestioned moral goodness of their pursuit—at least in the framework of the present-day political organization of the world. Since the atomic bomb, science is no longer pure intellectual enjoyment, from which nothing but good can arise for mankind; it is also playing with hell-fire.

Political activities

Immediately after the end of the war, in 1945, the potentially disastrous implications of modern science for a society to which peace had never been but an interval between two wars, became the obsession of many scientists. It led to their sudden entry into politics. They successfully agitated for the transfer of atomic energy development in America from the military to a civilian authority. They were instrumental in formulating the program of international control of atomic energy and making this program the official aim of American foreign policy. They established the Federation of American Scientists (FAS), with headquarters in

¹¹ Niels Bohr, "For an Open World," *Bulletin of the Atomic Scientists*, Vol. VI (July 1950), pp. 213-17, 219.

Washington and chapters in many centers of scientific research, to give organizational form to their concern with the use (or misuse) of science by nations. They founded the *Bulletin of the Atomic Scientists*—a monthly magazine dedicated to science and public affairs, now in its ninth year of publication.

In 1945, activities on behalf of civilian control of atomic energy in the United States, and its international control in the world claimed the support of a vast majority of American scientists. The news of these activities, carried to Europe, created a considerable impression among scientists there; an Atomic Scientists' Association was founded in England. However, the traditional European detachment of academic life from political power made it even more difficult (and less congenial) for scientists in Europe to seek and acquire influence on national policies than proved to be the case in America.

Fear of atomic war

Since 1948, disappointment in the outcome of United Nations negotiations, and the general trend of domestic and international affairs, have dampened the enthusiasm, and cynicism and confusion have taken hold of many American scientists. Many try to keep the tormenting picture of a future atomic war out of their consciousness, believing that there is nothing they can do about it. The pressure of security regulations and loyalty checks, and the—sometimes imagined but often real—threat to professional status arising from *any* public activity, favor this trend. The inducement of secure and relatively well-paid positions, with opportunity and plentiful funds for successful research, helps to encourage scientists to forget the potentially disastrous implications of their work, and to think only of professional

achievement and the incomparable satisfaction of discovery.

A minority, however, are unable to take their minds off the terrifying picture of an impending scientific war. A small group, imitating the example of conscientious objectors, found solution in a refusal to undertake any research having military implications. They banded together in a Society for Social Responsibility in Science, centered around the Quaker-sponsored college at Haverford.

A larger and undoubtedly more representative group follows the Federation of American Scientists, which has emerged from the crisis as an impecunious but stubborn and enthusiastic organization with over a thousand members all over the country. The practical work of this organization is now concerned mostly with analyzing and trying to influence government policies in scientific matters, such as security procedures, National Science Foundation, and so forth. The real *raison d'être* of the organization lies, however, not in these vital but transitory issues, but in the concern of its membership with the terrifying possibility that science may become the gravedigger of Western civilization, if not of mankind itself.

The *Bulletin* attempts to educate its 14,000 readers, in fifty-six countries, in the realities of the "atomic age." A small number of prominent scientists who have emerged from the war as top government advisers on matters of scientific strategy use their position to attempt a similar education on a different level. Their primary assignment is to keep America's lead in the perfection of scientific weapons; but in doing so, they can try to impress the political leadership with the inevitability of other nations' acquiring the same or similar devices and with the madness of the mutual holocaust of a war fought with them. There is, unfortunately, more

concrete evidence of their success in the first than in the second endeavor.

THE PRESENT PICTURE

This, then, is the American scientific scene ten years after the chain reaction that led to the atomic bomb: a greatly expanded army of scientists, with vastly increased funds for research but with little improvement in their own economic status; enjoying new respect in society and new influence in academic and industrial organizations and yet looked upon askance as a group of doubtful loyalty and an almost demonic capacity for evil; consulted by the Executive and rubbing shoulders with the legislature, but frustrated in at-

tempts to make the national leadership fully understand the nature of science and its fearsome implications.

In the face of this contradictory picture, the majority of scientists, particularly of the younger generation, tend to seek refuge in apolitical professionalism; while a minority remain intensely concerned with the way in which the "age of science" dawns upon mankind. They are depressed by their incapacity to make the world understand that eager acceptance of new scientific gadgetry for war and peace without the acceptance of a new rational code of political behavior is a path to disaster. They feel restless, frustrated, and apprehensive.

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Human Values in the Atomic Age

By WAYNE A. R. LEYS

THE fear of the bomb is not the beginning of wisdom. Fearful men have a kind of foresight, but in their partial view of the future all signs point to a foregone conclusion. How else could the frightening consequences of nuclear fission justify both McCarthyism and pacifism? McCarthyites, thinking only of alien threats, discover in the bomb a reason for aerial Maginot lines and subterranean loyalty investigations. Pacifists, horror-stricken by the worst conceivable results of war, find in the bomb a reason for wishfully accepting the imaginary benefits of an unborn social order.

The contributors to this volume are striving for a balanced interpretation of atomic energy, an evaluation of probabilities not dictated by the strength of passing emotions. Presumably, a clear-headed view of the facts should help men to make policy decisions with due regard for *all* legitimate human interests and not merely for the calming of fears. An impartial weighing of predicted consequences should do justice to the very fears that make emotional "isms" attractive, but not at the expense of other values.

Unfortunately, fact-oriented policy deliberations sometimes fail to reckon with the values that people find in highly charged ideologies. Fact-oriented studies are, in many instances, tentative, piecemeal, and bewilderingly complex. They may offer no immediate satisfaction to persons who crave peace of mind, a sense of direction, and a sense of importance.

The strength of all-or-nothing ideologies lies in their response to the exasper-

ating tensions that accompany the development of a world-wide economy and a new political process. The Communist and the emotional anti-Communist both yearn for a final showdown; they want to get it over. The pacifist wants to have nothing on his conscience. None of these people can tolerate unfinished moral business.

In estimating the ultimate impact of atomic energy on the ends of life, are fact-oriented policy thinkers missing something? Is there something of worth in the extremists' demands for finality, for emotional security and morale? Are the military repercussions of the A-bomb and the industrial uses of energy properly evaluated by a cold calculation of public benefits?

I do not question the desirability of prediction and farsighted planning, but perhaps not all the planning should be at the public level. It may be that public policy-making can succeed only if we recognize a disparity between public good and private good. A review of public policy deliberations will show, I believe, that subjective and emotional adjustments are required by the very attempts to solve the military and industrial problems of atomic energy.

MILITARY PROBLEMS

Immediately after the announcement of August 6, 1945, there was a great deal of utilitarian probing into the military consequences of A-bombs. The concern with future consequences ran through the report of the Secretary of State's Committee, the Acheson-Lilienthal report, the work of the United Na-

tions Technical Committee,¹ and many issues of the *Bulletin of the Atomic Scientists*. Most of the forecasters came to the conclusion that scientific knowledge could not be monopolized, that several nations might be expected to manufacture the new bombs, that within a few years no nation would be able to defend itself against attack, and that atomic war would be catastrophic.

Such predictions led to proposals for the international control of fissionable materials and their manufacture. The Secretary of State's Committee recognized doubts about the acceptability of an international control agency, but concluded: "... one should ask oneself 'What are the alternatives?'—We have, and we find no tolerable answer."²

Four wars and seven years ago that was the way things looked to the official thinkers. The eventual alternatives may not have changed in the meantime, but is the alternative with the horrible consequences still intolerable? Any hope of speedy action to prevent an atomic armaments race has now been dashed. Within a year or two after Hiroshima it was evident that the Soviet Government would not consent to international inspection and effective control. More ominous were the signs of a policy of relentless aggression.

If the Soviet Union had not blasted the hope of international control, American politics would have offered a major obstacle. There has been a reversion to nationalism. The constitutional amendment recently proposed, by Senator Bricker represents only the extreme form of this reversion. Sentiment seems to have been swinging away from ex-

ecutive agreements in the international field. If every faltering step toward international control must have the two-thirds vote of the Senate, it should be recalled that Senators representing 92 per cent of our population do not constitute two-thirds of the Senate.

The first major recommendation of atomic scientists and policy thinkers appears to have been a "political impossibility." Yet, no problem is solved by calling the future "intolerable." If intolerability is meant seriously, we might all embark on a revolutionary course of action, waging ruthless class war as the Communists and the emotional anti-Communists do.

The class warfare ideologies are not the only possible reactions to "intolerable" situations. Several systems of ethics have grappled with the predicament of individuals whose power is exceeded by the power of society. Two of these systems—stoicism and pragmatism—seem to me to merit the consideration of men who cannot persuade their governments to adopt their plans for preventing atomic warfare.

THE STOIC VIEW

Stoicism is, of course, preatomic. It flourished in the Augustan age; but it is well to recall that the Augustan age was a time when conscientious men were experiencing uncertainty and defeat. Their dilemmas were probably as distasteful as the situation that confronts men who believe in the international control of uranium and plutonium. Seemingly ruinous policies were being adopted in spite of the Roman Stoic's warnings. As a Stoic, he did not follow the Epicurean to a suburban retreat. Instead of that, he asked, "What is within my power and what is not within my power?"³ This question led him to

¹ The Scientific and Technical Committee, created by the United Nations Atomic Energy Commission in 1946.

² *A Report on the International Control of Atomic Energy* (Washington: Government Printing Office, March 16, 1946), p. 31.

³ The *Discourses* of Epictetus are timely reading for public officials, industrial executives, and labor leaders.

admit that he was only a small factor in the universe; he was a small factor in the Roman Empire. Although he could not be sure of success in any political controversy, it was within his power to try to do his duty. This virtuous intention would preserve his self-respect, and the achievement of a sense of integrity therefore was his proper objective. In a word, the Stoic found it necessary to distinguish between his personal goals and the goals of government.

Today the man who understands the need for atomic defense measures, as well as the man who believes in the demilitarization of atomic energy, is in the Stoic's predicament. He is not omnipotent. He may even concede that he is not omniscient. If he tries to do what he believes to be right, he is outvoted and outmaneuvered. He may be committing political suicide. But if he asks what is within his power, he may find something to live for, in spite of the fact that his proposals in behalf of the public good are laughed out of Congress.

THE PRAGMATIC VIEW

Pragmatic philosophers also recognize the difference between the power of individuals and the power of governments. Pragmatism is opposed to the stoic view in many respects, but the two philosophies deal with the same problem. The pragmatist asks, "What is the problem? What is *my* problem? How is thought about atomic energy related to my own activity?" While the pragmatist usually believes that public events are influenced by individual effort, he never confuses himself with the whole of society. He does not think it intelligent to try to solve problems-in-general. Public actions are joint products, and the individual's part in public action is always contributory. If idealistic programs are

not related to the limitations of the individual's actual situation, the ideals will turn out to be irresponsible talk.

When pragmatic criticism is applied to statements about the control of atomic energy, we find that many of the most sweeping assertions are made in an action vacuum. Take, for example, the first comment on atomic energy occurring in the publications of a study committee of the National Council of Churches. On page 62 of the second volume the reader is suddenly told by an economist that "... as gunpowder finally made the city-state impossible, so airplanes and atom bombs have probably made the nation-state impossible because indefensible."⁴

The interesting circumstance is that this assertion is not preceded nor is it followed by a review of the economist's special relation to atomic energy. In Volume I fifteen contributors outlined their investigation of the "values that are promoted (or not promoted) by our complex economy." They talked about capital accumulation, national defense, Communism, centralized government, nationalism, power, and economic progress. But they did not mention atomic energy in Volume I. The sudden questioning of fundamental loyalties on page 62 of Volume II, therefore, is one of those fitful deliberations in which discussion suddenly turns from subjects that economists are in the habit of discussing to atomic energy in general. Atomic energy is not approached from the economist's point of view as bearing upon the actions that the economist is actually influencing.

The difficulty is not peculiar to the authors referred to above. If you look at the index of the latest books on public policy, there is only a fair chance that you will find "Atomic Energy"

⁴ *The Organisational Revolution*, by Kenneth E. Boulding (New York: Harper & Bros., 1953), p. 62.

among the topics. When you do find the subject listed, it is the exceptional author who relates it to the main argument of his book.

An increase in available power (controlled energies) may not increase the political power of most human beings. It may actually decrease their power as leaders and as citizens. Even though, in one sense, there are now more means available for the achievement of some public ends, political action becomes more complicated. Hard-working leaders have to wait longer to see their efforts rewarded. Their contributions may be scarcely recognizable in the results finally obtained.

Anyone who tries to demilitarize atomic energy will experience the kind of frustrations that send the McCarthyites and the Communists off into a rage. The stoics and the pragmatists, in their differing ways, have thought about these frustrations. They acknowledge the difference between the power of individuals and the power of states, and they offer alternative ways of finding personal goals that are sufficiently independent of the success of public goals to make work in an unpopular cause tolerable.

INDUSTRIAL PROBLEMS

The industrial application of nuclear science also presents value problems that do not readily suit the planning frame of mind. The planning frame of mind is impatient with any sentiment that delays the setting of goals and the matter-of-fact determination of efficient methods for reaching those goals.

The goal-and-efficiency type of policy thinking is illustrated by the Iowa Plan for Atomic Energy Education. Between 1950 and 1952 the Iowa State Department of Public Instruction issued five study guides for use at every level from the elementary school to the adult

forum.⁵ The authors did a pioneering piece of work in making a lot of new knowledge understandable. They tried to satisfy the prescription which they quoted from David Lilienthal: "The discovery of the release of nuclear energy is so important, so fundamental, that the country will be wary of those who seek to treat it as just another weapon, just another invention."

In spite of this admonition, the Iowa planners focus attention upon atomic energy as a means of achieving ends to which Iowa educators were committed in the preatomic age: the increase of agricultural production, the control of disease, and the national defense.

However commendable the courageous Iowa enterprise, it is doubtful whether productivity, health, and national security are the uses which many persons *really* want to make of atomic energy. It is doubtful whether efficient planning for these purposes will satisfy the politically active citizenry.

The intrusion of unstated goals into legislative deliberations has occurred under the guise of appeals to traditional liberties and precedents. Thus, the debate over the Atomic Energy Act of July 30, 1946 has been carried on by spokesmen for the *traditional* supremacy of civilians in government and by spokesmen for the *traditional* freedom of private enterprise. Scientists have complained about restrictions on their time-honored freedom to publish and exchange information. Labor has worried over limitations placed on collective bargaining in atomic energy installa-

⁵ The titles are *The Iowa Plan for Atomic Energy Education*; *Preparing Elementary Pupils for the Era of Atomic Energy*; *The Atom and You: A Unit for Secondary Schools*; *Iowa Citizens Investigate the Atom*; and *Scientific and Social Aspects of Atom Energy: A Source Book for General Use in Colleges*. Published by the State of Iowa and issued by the Department of Public Instruction, Des Moines, Iowa.

tions. The champions of civil liberties have objected to loyalty investigations and the introduction of political tests of the right to work. Others have viewed with alarm the absence of the traditional practices of home ownership and local self-government in Oak Ridge, Richland, and Los Alamos. The residents of Ellenton, South Carolina, protested the decision to take a quarter of a million acres in their neighborhood for an Atomic Energy Commission project; and sympathetic reporters played up the action as "unprecedented." There has been growing objection to the appropriation of public funds without public hearings, in view of the congressional tradition of requiring administrators to justify the number of paper cups requisitioned for use at office drinking fountains.⁶

CONFLICTING INTERESTS

When the phrase "military necessity" loses its magic, the discordant opinions may be expected to become even more conspicuous than they have been during the last eight years. If, in an abstract way, people are generally agreed on the desirability of increased economic production, they are not agreed on the division of costs and gains, nor are they agreed on the extent to which traditional privileges shall be sacrificed for the sake of progress.

The conflicting interests of the whole world are involved in the politics of atomic energy. Nehru told the Pan-

⁶ Most of these controversies are well known. The following references may be useful for two of the less familiar debates: Donald B. Straus, *The Development of a Policy for Industrial Peace in Atomic Energy*, Planning Pamphlet No. 71, National Planning Association, July 1950; Lyman S. Moore, "Democratic Local Government in AEC Communities," *Bulletin of the Atomic Scientists*, January 1951, pp. 19-22. Also, "Report on Operation of Atomic Energy Commission Towns," prepared for the Atomic Energy Commission, April 20, 1948.

Asian Conference in March 1947 that Asia would play her part in the atomic age, not as a pawn but as a partner. "Peace," he said, "can only come when nations are free and also when human beings everywhere have freedom and security and opportunity." But freedom means votes and vetoes, not only by progressive leaders but also by those "who, if they have eyes left to weep with, spend sleepless nights in cursing God because he has allowed these civilizers to get into their land."⁷

The release of atomic energy seems to foreshadow more conflict rather than less conflict. Increases in productive capacity multiply the possibilities of mutual interference, particularly in the case of hitherto subject or silent peoples. The diffusion of knowledge means that more diverse demands are articulated and become the source of political pressuring. It is not only vested interests that get in the way of economic progress; it is also parochial versions of universal good that men will fight for. Mankind seems to be afflicted with small ideals at the very moment when the means for great achievement are available. It is the old story of the ditch-digger who won the Irish sweepstakes; his first thought on learning of his good fortune was that he should buy a new pick and shovel.

Pacifists cannot believe that the collective intelligence of humanity will always sacrifice great common benefits for little, local privileges and slogans. Pacifists call for an act of faith to give direction to the universal longing for peace.

The plausibility of pacifism has been attacked by a long line of "realists" who have doubted the strength of peace-loving motives. The doubters began with an attack on the most famous organic political philosophy, Platonism.

⁷ Radhakrishnan's description, a generation ago, of the attitude of some men of the East.

They observed that Plato was bothered by the inconsistency of human purposes and that he proposed the pursuit of the common good. But the critics also observed that Plato was not averse to a centralized management of every citizen's private life—a high price for harmony. The critics also recall that, since Plato's time, there have been other idealistic philosophies whose practical followers have sometimes resorted to dictatorship.⁸

TWO KINDS OF PEACE

The impracticality of plausible political idealisms may be explained by the confusion of two kinds of peace—political peace and peace of mind. Plato related "harmony in the state" to "harmony in the soul." He insisted that there was a necessary connection between these two kinds of peace. Contemporary pacifists make the same assumption. They confuse the universal desire for peace of mind with devotion to political peace.

The more we learn about political peace, the less is it identifiable with peace of mind. The causes of industrial peace, for example, are not the disappearance of disquieting antagonisms. Industrial peace comes when antagonisms are channeled into the political processes of negotiation.⁹ Although exhausting and disgusting, the raucous bargaining of managers and union men is what informed people mean by industrial peace. Wherever there is no challenging and no denouncing, one finds the dictatorship of one party and, quite

possibly, the seeds of violent revolution.

International peace, likewise, does not descend upon the earth as an era of good feeling. International peace is a time when resentments are being talked out and decisions go to those who argue loudly (but not to those who "argue best in platoons"). In a world of human diversity and ingenuity, peace is not conducive to peace of mind. Peace means noisy debate. Peace means uncertainty and many of the irritations that we associate with the "cold war."

The impact of atomic energy, like the impact of other life-complicating inventions, is widening the gap between public necessities and personal satisfactions. To secure the benefits of atomic energy without a massacre, we must maintain political processes that are unpleasant and nerve-racking.

We must be reminded of engineering installations so vast and so intricate that, in addition to the engineering, there is a personnel problem. The engineers become exhausted and have to be pulled off the job; or they quarrel and cannot co-operate. The existing blueprints for the atomic age specify technical tasks under such difficult conditions that morale and sanity are imperiled.

The plain fact of the matter is that very few human beings are willing to accept the rigors of peaceful negotiation. They do not have the patience to do so. They do not know how to find the tolerable minimum of personal satisfaction in strenuous, unisolated life.

It seems that political peace (a public condition) is very different from peace of mind (a private possession).¹⁰

¹⁰ In one way or another many recent philosophers have given up the quest for a panacea that will provide both political peace and peace of mind. See Paul Arthur Schilpp (Ed.), *The Philosophy of George Santayana* (Evanston, Ill.: Northwestern University, 1940), pp. 3-30, 560-73; T. V. Smith, *Atomic Power and Moral Faith*, Claremont, Calif.:

⁸ A helpful review of the organic philosophies and the philosophies of political realism will be found in an essay on "Political Morality" by Herbert Schneider in *American Philosophy Today and Tomorrow* (H. M. Kallen and Sidney Hook, editors), New York: Lee Furman, Inc., 1935.

⁹ See pamphlet series, "The Causes of Industrial Peace," National Planning Association, 1948.

Political peace is a matter of agreements and acquiescences in public measures. Peace of mind may be fostered by public measures, but only indirectly and—to a large extent—by measures that are different from those that mediate the great social conflicts.

Two inferences may be drawn from the ambiguity of "peace." The first inference is that the weaker interest, the desire for political peace, needs education. The release of atomic energy is completing the destruction of the isolation of human communities. It probably means more gigantic human organizations. It creates industries that affect the public interest not only in a national sense but in an international sense. Education for the politics of such a society must build an appreciation of negotiations that resolve conflicts, no matter how annoying and personally offensive the in-fighting.

The second inference is that the stronger interest, the desire for peace of mind, must find more satisfaction in private pursuits. Peace of mind may be fostered by improvements in education and recreation, by the encouragement of the fine arts, by the betterment of local communities, by movements that secure a wider distribution of deference. Morale may also be preserved by making provision for periodic relief from arduous political duty. Whereas public agencies must never relax, officials need week-ends, vacations, and

times out of office. Whereas the price of good government is eternal vigilance by an organized citizenry, one requirement for good citizenship is the emotional balance that comes to the person who can get a good night's sleep.¹¹

CONCLUSION

Knowledge is power; but the more men know about the atom, the more they need to know about themselves. Our heavy investments in the release of atomic energy could have the effect of stampeding us into some single-minded folly of avarice, hatred, or fear. I have tried to show how the sense of personal responsibility cannot be fulfilled without some appreciation of the limitations of the power of individuals. I have also indicated how citizens may be victimized if they insist upon finding peace of mind in public action. The contrast between public values and personal values has been heightened. A half-educated and overpropagandized world needs an enrichment of private life as well as an appreciation of politics (which has little intrinsic value but is necessary to secure the public good). Knowledge becomes wisdom when coupled with respect for the plurality of values. Then, no objective can be worshipped so idolatrously that it will seem to justify the sacrifice of all other human purposes.

Claremont Colleges, 1946; Richard McKeon, "The Philosophic Bases and Material Circumstances of the Rights of Man," *Ethics*, Vol LVIII (April 1948), p 183; John Dewey, *The Quest for Certainty*, New York: Minton, Balch & Co., 1929; Karl R. Popper, *The Open Society and Its Enemies*, Princeton: Princeton University Press, 1950; Georg Simmel, "Der Streit," in *Soziologie*, Leipzig, 1908.

¹¹ The reference to sleep is illustrative only. The limitations of space do not permit a comparison of escapist and nonescapist private activities. I would not want any reader to interpret my statement as placing equal value on all private activities. I do not, for example, recommend a general retreat to the place on Avenue O, which an enterprising tavern keeper has named "The Atomic Cocktail Lounge."

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INTERNATIONAL RELATIONS AND WORLD GOVERNMENT

SNYDER, HAROLD E. *When Peoples Speak to Peoples*. Pp. xiii, 207. Washington: American Council on Education, 1953 \$3.00.

This small volume, published by the American Council on Education, is a most useful publication for persons interested in international cultural relations, and the excellent way in which Mr. Snyder has treated his subject should lead to a greater and more exact knowledge of this highly important field. Indeed within less than two decades the American public has become very conscious, through the activities of governmental agencies and an ever-increasing number of private organizations, as well as through the enthusiastic interest of influential private citizens, that intercultural understanding constitutes one of the most fundamental bases of lasting peace. This subject is not "presumably boring," as the author suggests on the first page of Chapter 1, but is replete with items of the most lively human interest.

The title of the book, "When Peoples Speak to Peoples," is especially apt. Governments speaking to governments, or governments speaking to peoples, are not nearly as vital or thrilling as "When Peo-

ples Speak to Peoples." It reminds one of the distinction between the words of the Covenant of the former League of Nations, "We, the Contracting Parties . . .," and of the Constitution of the United Nations, "We, the People. . . ." There is a world of significant difference between the two! Because of his experience in the United States and abroad, as director of the Commission for International Educational Reconstruction and the Commission on the Occupied Areas, Mr. Harold E. Snyder has had very signal and rare opportunities to write on the need of coordinating the great number of activities designed to improve international understanding that developed during the last years of World War II and in the period that has followed.

The first part of the volume is devoted to "Cultural Relations in the Postwar World," and the second part to "Making Action Programs Effective." In the Appendix, there is a useful list of addresses of agencies operating in this field, and also a brief bibliography of books on this subject. That this topic is of recent emphasis is attested by the fact that of the fifty titles listed in this Bibliography only three antedate 1945, or the close of World War II. The three in question were published in 1940, 1941, and 1944. Perhaps a more

careful check should have been made of the list of addresses of agencies. The Committee on Friendly Relations Among Foreign Students, with which the present reviewer has been associated for many years, moved several years ago to 291 Broadway, New York City; and also the address of the Institute of International Education is given on page 183 as 857 Fifth Avenue, and on page 185 as 1 East 65th Street. Those two addresses are the same building, but it would be less confusing to use only one of the addresses. There may be other slips as well.

There are some very telling and vivid descriptions in this volume, as well as those of very practical usefulness. Among these is the description of the growth of the United States cultural programs, the work of the CIER in educational reconstruction, the differences in American and European attitudes at the end of World War II, as well as the plight of education at that time, the relation of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) to CIER, the universities and international education programs, and some very sage comments on the criteria for developing voluntary action programs. There are various wise cautions in the discussion about those who represent us abroad either officially or as travelers, on understanding the common man, on racial prejudice, and on the interaction of domestic and foreign influences. Different chapters in Part II are devoted to the Interchange of Individuals, the Interchange of Groups, and the Interchange of Materials.

This reviewer looked in vain for any single reference to the short-lived International Education Assembly, with which he was intimately associated, and which was successively under the leadership of Dean Grayson N. Kefauver, of the School of Education of Stanford University, and of Dr. William G. Carr, of the National Education Association. The International Education Assembly was a pioneer organization during World War II, which, in a very real sense, prepared the way for the organization of UNESCO. The work of the IEA should not be lost to sight.

All persons actively engaged in interna-

tional cultural activities should have available a copy of Mr. Snyder's book, and the volume should also be accessible to any persons generally interested in this significant field.

EDGAR J. FISHER

Amherst, Virginia

BARRETT, EDWARD W. *Truth is Our Weapon*. Pp. xviii, 355. New York: Funk & Wagnalls Company, 1953. \$4.00.

This timely book is a persuasive plea for a sustained propaganda campaign abroad as an indispensable instrument of America's world leadership, and as a possible peaceful means of winning the cold war. Edward Barrett is admirably qualified to present this case. Experienced in the field of newspapers and magazines, he served in executive positions during World War II in psychological warfare under General Eisenhower and in the Office of War Information, and he then helped to establish the Voice of America. Returning to government service in 1950 as Assistant Secretary of State, he had charge of propaganda abroad during two critical years.

In Part One, Mr. Barrett reviews briefly the historical background of our propaganda efforts, the postwar decline of interest paralleling the thoughtless military demobilization, the slow revival after the inauguration of the Marshall Plan, and President Truman's announcement of the "campaign of truth" in 1950. A chapter on "The Voice of McCarthy" deals forthrightly with the Wisconsin senator. Part Two considers "The Foes We Face." In the front rank, the author naturally places the men of the Kremlin and their purposes of world revolution and world domination, but he also includes as foes those on our side who are defeatists, advocates of preventive war and of liberation through insurrection. In Part Three, he offers much wise counsel. Propaganda alone, without adequate military strength and suitable policy decisions, will not be effective. He would revise the present procedure of congressional control to prevent irresponsible attacks, stabilize appropriations at a small fraction of the total defense costs, make the higher posts more attractive to the best qualified men, assure a close associa-

tion with policy making authorities, and centralize strategic decisions in Washington while leaving discretion in tactics to the responsible deputies in the field.

The author writes with "a deep sense of urgency." He sees in propaganda, or in "persuasion" as he prefers to call it, the one possible escape from a third World War. "The right words striking the right persons at the right time can change the course of history." Certainty is impossible, and doubt results in disruptive propaganda which goes beyond resistance to Communist imperialism. In this connection, the inclusion of sample broadcasts as delivered to the peoples of the Soviet Empire would have been helpful.

E. MALCOLM CARROLL

Duke University

DENNETT, RAYMOND, and KATHERINE D. DURANT (Eds.). *Documents on American Foreign Relations*. Volume XIII: *January 1-December 31, 1951*. Pp. xxiv, 626. Princeton: Princeton University Press (for the World Peace Foundation), 1953. \$7.50.

The World Peace Foundation's *Documents* series has long since been established as an indispensable tool to the specialist in foreign affairs. This latest volume fully meets the high standards which the editors have previously set. For breadth of coverage, convenience of arrangement, lucidity of editorial notes, and sheer quantity of key documents presented, it is unmatched by any other publication, governmental or private.

The pattern of the book follows that of previous volumes: sections on general themes appear first (Principles and Policy, Conduct of Foreign Relations, National Defense, Economic and Military Cooperation, International Peace and Security), followed by sections dealing with functional topics (Dependent Areas, Trade and Finance, Transport and Communications, Agriculture and Natural Resources, Labor and Social Problems, Cultural Relations), and the whole is concluded by documents on relations with geographic regions (Western Hemisphere, Asia and the Pacific, Europe, Middle East and Africa).

The year here covered (1951) was a

turning point in the cold war—as perhaps every year since 1947 has been. It saw a low tide in American and United Nations fortunes in the Korean war with the Chinese Communist onslaught, and saw that onslaught eventually slowed to a halt. It saw the dismissal of General MacArthur and the resulting "Great Debate" on foreign policy. It was the year of the Japanese peace treaty and the Pacific defense pacts with Japan, Australia, New Zealand, and the Philippine Republic. It was the year of Universal Military Training, of the Mutual Security Agency. If a single term could characterize it, perhaps "consolidation" would do. American opinion seemed to move steadily toward support of long-range commitments and arrangements in foreign policy and defense on a scale and of a permanency to match the ubiquity and the tenacity of the foe.

With this thirteenth annual volume, the World Peace Foundation ends its sponsorship; future volumes will appear as a supplementary series to the Council on Foreign Relations' annual publication *The United States in World Affairs*, and will be published by that organization. While deeply appreciative of the subsidies, time, talent, and eyesight expended on the series by the Foundation and its able staff, this reviewer feels the new arrangement is to be welcomed. The two series are intrinsically supplementary. Under whatever sponsor each will gain in usefulness (and one hopes in use) if planned and produced by a co-ordinated editorship.

OLIVER BENSON

University of Oklahoma

WILSON, ROBERT RENBERT. *The International Law Standard in Treaties of the United States*. Pp. xii, 321. Cambridge, Mass.: Harvard University Press, 1953. \$4.50.

The term international law or law of nations appears explicitly in treaties to which the United States is a party over 200 times and references to the concept are implicit on many other occasions. About a third of these are in treaties providing for pacific settlement of disputes. Extradition treaties, treaties relating to war and neutrality, treaties concerning diplomatic and consular

officers, treaties concerning rights of resident aliens, and treaties of commerce also contain such references.

In this volume Professor Wilson explains the diplomatic background of many of these treaty provisions, their legal significance, and their practical utility. In doing so he includes interesting and little known items of diplomatic history and judicial reasoning.

The discussion illustrates the relationship between conventional or special international law on the one hand, and general or customary international law on the other. All treaties are made against a background of general law without which the meaning of terms would often be obscure and the intent of the whole instrument illusive. More specifically, international law is referred to as the basis for dealing with disputes; as the source for interpreting terms such as "piracy," "neutrality," and "domestic jurisdiction"; or as the standard to be applied in dealing with aliens. The standard of international law may be more favorable than "most-favored-nation" or even "national" treatment.

Professor Wilson has had practical experience in the Department of State and makes some use of unpublished documents. He writes carefully on a hitherto unexplored topic. His book is for the profession rather than the general public, but it constitutes an important contribution to the understanding and perhaps to the effectiveness of international law. In this period, when "power politics" dominates so much thinking in the international field this contribution is valuable. He suggests important functions of international law, not always appreciated but susceptible of development.

Appendixes stating the practices of other great powers in utilizing the international law standard, indicate that the United States has taken an advanced position.

The process by which treaties continually introduce new principles, modifying the old law, while at the same time the general law governs the interpretation of, and provides standards for, treaties, suggests how order and progress, law and politics, may be combined in an evolving

system of stable and progressive international relations. Studies like this indicate the superficiality of the criticisms of international law by some "realists" in the international field.

QUINCY WRIGHT

University of Chicago

KUHN, ARTHUR K. *Pathways in International Law*. Pp. xi, 240. New York: The Macmillan Company, 1953. \$4.00.

Mr. Kuhn's "personal narrative" is above all an account of his lifelong and eminently successful activities—studies, practice, teaching, creative pioneering—in the field of international law. The story offers but glimpses of the nature of problems in this field, none of which is profoundly analyzed as such. Each problem of issue is described just sufficiently to explain the background for the author's views which are mostly quoted verbatim from lectures, speeches, or previous publications. The problems he mentions range over the entire field of international law—from collective security and peace-making to private international law (conflict of laws) with such questions as the validity of treaties and nationalization of foreign property in between. Together, they add up to a panoramic picture of the manifold and fascinating situations to which international law is supposed to apply. No less interesting are the author's views, which demonstrate a felicitous sense of balance between what is desirable and what is possible in the international field.

Regret arises from the fact that the author has failed to elaborate and state the underlying philosophy that may have guided him in formulating his opinions. His conservative position on the problem of promotion of human rights by international organization (he strongly attacks the classification of social and economic advantages as rights) strongly contrasts with his "progressive" views on the Nuremberg trials which, along with the Genocide Convention, he hails as unquestionable gains. What are the fundamental political theories that would give meaning and consistency to Mr. Kuhn's various judgments? The reader would have greatly profited had Mr. Kuhn's narrative penetrated to

this deeper and more important layer of thought.

GERHART NIEMEYER

Council on Foreign Relations
New York

ROBERTS, HENRY L., and PAUL A. WILSON.
Britain and the United States: Problems in Cooperation. A Joint Report. Pp. xvii, 253. New York. Harper & Brothers for the Council on Foreign Relations, 1953. \$3.50.

This joint report of two unofficial study groups of the Council on Foreign Relations and of the Royal Institute of International Affairs, completed in October 1952 after 18 months of exchanges, is a masterly work of critical self-examination and the exposition of agreements and disagreements. It is a substantial contribution of insights and information to the Anglo-American bookshelf which is by no means overflowing. It is also a demonstration—considered by the participants to be the “real achievement”—“that with patience, inquiry and frank discussion, it is indeed possible for the citizens of one nation to gain a comprehension of the motives and methods of another, a necessary first step in the resolution or composition of their differences in foreign policy.”

“... Cooperation between the two countries will not occur automatically.” Also, “It is wholly to the good that the Anglo-American community is not monolithic. . . .” The importance of closer co-operation permeates the study—“to each the other is its most important single ally.” Yet the two groups successfully avoid the impression of advocating the “ganging up” of Britain and America against their partners in the Western alliance and the rest of the free world.

The issues, essentially handled as case studies, range over the bases and obstacles to Anglo-American co-operation, the interplay of domestic politics and foreign policy, problems of general economic policy (containing, *inter alia*, a brief, understandable exposition of sterling balances and convertibility), the economic impact of rearmament, global military problems, the United Nations and collective security, and relations with the Soviet Union and East-

ern Europe. Separate, lucid chapters are then devoted to Western Europe, the Mediterranean area, the Middle East, South and Southeast Asia, and the Far East.

The study group points out that it did not have time to tackle issues such as the standardization of weapons, the stationing of American troops in Britain, and the exchange of information concerning atomic energy, and to probe more deeply colonialism, Commonwealth relations, the international oil problem, and the functioning of the United Nations.

One of the differences likely to intrude between us is that “the British believe that to many problems there is no quick, tidy and final solution.” A successful effort in trying to distinguish and describe the predominant band or bands in the spectrum of informed opinion in the two countries could help predict divergences. The book is not filled with predictions, but an illustration is given—we tend to be nervous about the British moving too hastily in the Middle East, and the British tend to be nervous about our responses in the Far East (p. 249). “It is the part of statesmanship to foresee possible divergences between allies before they arise. This can be achieved only through continuous study and consultation” (p. 250).

The co-operative procedure of this study is no doubt an expensive one. Yet one wishes that the technique could continue to be applied—not only to Anglo-American relations, but to other crucial areas of international relationships. Possibly modest adaptations could be devised by additional institutions and groups.

RICHARD H. HEINDEL

Washington, D. C.

OSGOOD, ROBERT ENDICOTT. *Ideals and Self-Interest in America's Foreign Relations.* Pp. xii, 491. Chicago: University of Chicago Press, 1953. \$6.50.

Professor Hans J. Morgenthau's well known position on power politics is being refined and implemented by publications of the Center for the Study of American Foreign Policy which he directs at the University of Chicago. Dr. Osgood's book is one of these publications, and it makes

a threefold contribution to the Morgenthau thesis. In the first place, United States diplomatic history from the time of the Spanish American war to the present is evaluated in terms of the power politics position. Furthermore, diplomatic history, so written, becomes more than a mere record of events. We have here a study of the motivations of key opinion leaders and the response of the general public to this leadership. Finally, the Morgenthau concept of realism as stated in *In Defense of the National Interest* is redefined. Osgood would condemn "Realists" (which he spells with a capital R) along with idealists and would accept a happy compromise whereby the visionary, long-run goals of the latter would be joined by the short-run power considerations of the former. As Quincy Wright wrote in 1952, both power and values, both conditions and symbols, both passion and reason, both necessities and choices have influence in human affairs, and Osgood would call a policy which takes into account these considerations "realistic" (spelled with a small r).

For the social scientist, Dr. Osgood's book has many of the delights of forbidden fruit. His analyses of motivations are absorbing and penetrating although not always convincing. That Henry Cabot Lodge was not motivated primarily by his hatred of President Wilson but rather by his realistic evaluation of the League of Nations (pp. 282, 292) suggests that Dr. Osgood, like many realists, places reason before emotion as a motivating factor. Assuming the function of the Devil's Advocate the author blames the idealists, not the realists, for destroying Wilson's fourteen points (p. 288), defends the 1935 neutrality laws (p. 367), and blames Colonel Stimson for supporting blindly collective security for the sake of collective security (p. 354).

But the question a reader must eventually ask himself, if he has not already done so, is what useful service to the field of international relations do the obviously ambiguous terms "Realism," "idealism," and "realism" render? It would not be difficult to disregard the demands of the militaristic jingoists or the molly-coddle pacifists. But is there an alternative policy

upon which "realists" themselves might always agree? Finally, it seems to this reviewer that Dr. Osgood's "realism" is weighted on the side of the "Realists." It does not embrace a consideration of long-run as well as short-run policies, of human as well as national interests, of co-operative as well as oppositional policies. Nonetheless, Dr. Osgood has produced a well-written work which is both provocative and entertaining.

MARTIN B. TRAVIS, JR.

Stanford University

WILLERT, ARTHUR. *The Road to Safety: A Study in Anglo-American Relations*. Pp. viii, 184. New York: Frederick A. Praeger, 1953. \$3.50

Sir Arthur Willert has written a very timely and penetrating commentary on a crucial phase of Anglo-American diplomatic history. *The Road to Safety* dips into Sir Arthur's own memoirs and the memoirs of those key figures in the harrowing story of Anglo-American relations in the first World War—Lord Northcliffe, Lord Reading, Mr. Balfour, President Wilson, Colonel House—and especially it dips into the unpublished notes from the fantastic career of Sir William Wiseman, the "Lawrence of Diplomacy."

Sir William Wiseman moves through the pages of this narrative as the confidential Englishman who suddenly became the intimate of Colonel House and of President Wilson, and who so quietly and effectively worked to straighten out the tangle of Anglo-American relations during those crowded years.

Toward the end of 1916 the Old Diplomacy represented by Sir Cecil Spring Rice and the British Embassy in Washington began to bog down hopelessly at the job of breaking through the crust of formality which stood between Wilsonian idealism and British pragmatism in London. "The routine relationships of the Embassy," writes Sir Willert, "were carried out conscientiously by a grossly overworked staff. But in high affairs it had virtually ceased by the end of 1916 to be regarded by Washington as the link with London."

In the meantime, the American Ambassador in London, Walter Hines Page,

had "fallen into equal disfavor with Washington as being too much in the pocket of the British to be fit to fight their diplomatic battles." Into this situation was projected Sir William Wiseman, the understanding and always sagacious, young, and charming Englishman from the information section of the Embassy. Colonel House first met him in the Autumn of 1916 and in their first interview, finishing official business in a few minutes, kept him talking for two hours. Other meetings followed at House's invitation, and the foundations of their intimacy soon placed Wiseman's relation with House almost on a plane of that of "son to father." "It was odd," concludes Sir Arthur, "that Winchester and Cambridge and Texas could have produced two men with so much in common in spite of the difference of their ages."

From this warm friendship with Colonel House, Wiseman soon found himself on terms of comfortable familiarity in the White House and possessed of a real insight into the mind of President Wilson. And so it was that the Wilson-House-Wiseman relationship, with Spring Rice's blessing, became "a bridge across the chasm" which separated the Embassy from the Administration. "Do what you like," Rice is quoted as saying, "go where you like, and, of course, don't tell me anything you think I oughtn't to know." This was the combination which handled the succession of top problems which the tumultuous days of the early years of Anglo-American partnership thrust at the heads of the British and American governments.

There are places in the swift narrative where students of the period will wish that the author had found it possible to widen the limitations of the all too brief text for a fuller discussion of weighty matters—for example, in the section on "Unconditional Surrender." But perhaps this may follow in a later volume. Certainly, however, Sir Arthur's most readable study is convincing evidence that no history of the Anglo-American partnership can be complete which fails to highlight this fascinating chapter in the brilliant career of Sir William Wiseman's mission in understanding. This is the chapter which supplies

the insight into how the bridge was first built between the old diplomacy and the new. Others were to follow twenty years later—Hopkins, Harriman, Roosevelt, and Churchill—but Sir Arthur Willert's story marks the beginning of this great enterprise.

—GEORGE L. RIDGEWAY

New York City

POSSONY, STEFAN T. *A Century of Conflict: Communist Techniques of World Revolution*. Pp. xx, 439. Chicago: Henry Regnery Company, 1953. \$7.50.

One of the central problems of international politics today is whether those who direct Russian policy still adhere to the Marxist doctrine that Communism must be world-wide or whether they believe that at least for a workable future of a generation or two Communism can exist peacefully in a world part of which is organized on other principles. Professor Possony believes firmly that the present government of Russia is thoroughly committed to the first doctrine, that they believe that a world divided between Communism and Capitalism—in any of its forms—cannot stand; and he holds that they are determined to make the world Communist.

Professor Possony is an admirable historian, and he spends some two-thirds of his book in a careful and well-documented account of the development of orthodox—that is, Marxist-Leninist-Stalinist—Communism in Russia as a revolutionary force in the world. He neglects neither theory nor practice, which he well knows are subtly and constantly related. His main emphasis is on Communist concepts of revolutionary tactics and strategy, which he convincingly shows to have been based from Marxist beginnings on a supple willingness to use force, intrigue, propaganda, burrowing from within; or, put negatively, on a complete contempt for the basic Western belief in a fundamental moral order in politics.

Marx himself seems to have believed, not exactly that Capitalism would fall of itself, from its own "internal contradictions," but at least that it was slowly but surely rotting and would need no more than a final shove from the leaders of an

organized proletariat. Professor Possony does not believe that the men in the Kremlin today are naïve enough to hold this primitive Marxist doctrine; they have in their thinking introduced a variant. "Where Marx was inclined to expect spontaneous and natural developments," he writes, "the modern communists act to infect capitalism artificially. Communism is seen not as the product of relatively uncontrolled historical processes but as the consequence of sociological warfare" (p. 375).

The book concludes with an analysis of the complex methods, and especially the military methods, the present generation of Communist leaders are trying to use to bring to pass what Marx appears to have considered the inevitable working out of historical dialectic. But it is a careful, firm, and realistic analysis, by no means a frightened one. This is not a book that finds Bolsheviks under the bed, not a book to lead sensible readers to alarmist measures that will destroy our democracy in the effort to preserve it—that will, in fact, do just the work of Communists want us to do. Professor Possony by no means believes war with Russia inevitable. "The objective of our strategy should," he writes, "be to make all-out war an *extreme risk* for the Soviets, and to work toward a gradual modification, contraction, and replacement of Soviet rule" (p. 422).

CRANE BRINTON

Harvard University

MEISSNER, BORIS. *Russland, die Westmächte und Deutschland*. Pp. 372. Hamburg: H. H. Nölke Verlag, 1953. DM 12.—.

This scholarly treatise presents a chronological survey of Soviet policy toward Germany from 1943 to the end of 1952, and its relationship to the policies pursued by Western powers. It is, in the words of the author, "only a preliminary study of a later investigation into international law." As such, it furnishes the reader with a carefully annotated documentary basis for further study, since it contains little interpretation or evaluation of the objectively presented materials. The thoroughness of

the documentation is attested to by no less than 1,150 footnote references and citations.

The work covers two historical periods, the first extending from the Teheran conference in 1943 to the Potsdam conference in 1945, and the second period from Potsdam to the end of 1952. Until the Potsdam conference, Germany and Poland occupied the focal point of Soviet foreign policy. "But with the surrender of Japan and the atom bomb, her policy was extended to the near east and the far east where it came in contact with the vital, common interests of Anglo-Saxon powers, who were no longer ready to tolerate a further extension of Soviet power, without corresponding concession" (p. 77).

Basic to an understanding of the divergent policies advocated by the Soviet Union and the Western powers, respectively, in dealing with Germany, particularly since 1945, are fundamental ideological differences, stressed by the author. "Marxian-Leninist schooled Soviet thinking expresses itself in the first instance in economic and sociological categories. Demilitarization, denazification, and democratization have always been interpreted, from the Soviet viewpoint, merely as means to a profound social transformation" (p. 49).

It is these differences which must be borne in mind, when interpreting frequently changing Soviet policy toward Germany since 1943. Strategy and tactics are altered with changing conditions, but the primary objectives, to extend Soviet power and to maintain a "cordon sanitaire" have remained unchanged. All this is clearly demonstrated in the documentary evidence presented by the author. Tactics, involving the peace offensive in 1950, yielded to so-called defensive measures, following the inclusion of West Germany in the North Atlantic Pact in 1952.

Charges of ambitious aims of world domination appear in quotations from statesmen in both the Soviet Union and the United States. Thus the recently discredited Beria is quoted as saying, "The seizure of world rulership is the chief goal of American foreign policy," while former President Truman is quoted, "the danger of world conquest by the Soviet Union

threatens our freedom and threatens that world in which the free spirit of man can continue to exist." The threat of aggression is dramatized by spokesmen of the Soviet Union and of the Western powers alike. But charges and countercharges do not conceal the power struggle between East and West, in which Germany has been playing a buffer role.

Time alone will tell how this struggle, insofar as Germany is concerned, will be resolved. The issues seeking settlement at the conference table, if they are not to culminate in open conflict, are so vast and so complex that they challenge human ingenuity to find their peaceful solution. In the author's concluding observations, "The Soviet will to understand and the possibility of a compromise solution, will, to be sure, permit itself to be judged only after a new meeting of the 'Big Four'." Such a meeting might smooth the road for a European peace congress, with all of Germany participating" (p. 360).

This invaluable source book of first hand documentary materials pertaining to Soviet and Western Powers policies toward Germany should prove an indispensable addition to the library of every student of international politics.

KARL SCHOLZ

University of Pennsylvania

PENROSE, E. F. *Economic Planning for the Peace*. Pp. xiv, 384. Princeton, N. J.: Princeton University Press, 1953. \$7.50.

Economic Planning for the Peace is based largely on the author's personal experience in London, from 1941 to 1947, as economic adviser to Ambassador Winant. It deals with events with which the author was associated and reflects the results of contacts with individuals and of participation in groups of international specialists devoted to the task of leading a warring world towards orderly recovery and peace. The book is based less on the customary documentary research than on notes, memoranda, and first-hand knowledge acquired from the "inside" during the period when plans were in process of formulation, integration, and adoption.

The central thesis maintains that the

errors of the peace were the result of omissions and of a faulty sense of proportion in planning for different aspects of postwar international economic activities. Accordingly, the treatment is based on three broad classifications of postwar activities, the specific aspects of which are traced in chronological sequence. Long-term measures of international economic organization include the specific subjects of international finance and investment, international raw materials agreements, and international trade. The problem of relief distinguishes between two aspects, namely, food relief and the establishment of an international relief organization. The third classification deals with reconstruction under two subgroups dealing, respectively, with the liberated Allied countries and the ex-enemy countries. Changing political conditions and the impact of great personalities upon the emerging plans left their final mark in great successes, such as the saving of Europe from immediate postwar disaster, and in the kind of serious errors which permitted the crisis of 1947. Plans for short-run measures and those for the long-run became increasingly separated as time passed. The more successful efforts lay in planning for the long-run while consideration of the area between immediate relief measures and long-range measures was piecemeal and often belated.

The book is a major contribution to both the economic history and the economic thinking of the period even though admittedly slanted somewhat towards the British point of view. In attributing to the lack of shipping (p. 341) the inability of the Latin American countries to meet their wartime and early postwar import demands, the author failed to mention the more fundamental reason, namely, the almost complete unavailability in the United States of the goods Latin America was eager to purchase with its large accumulation of dollar balances. Such omissions are few and usually fade into insignificance as the author outlines, in clear nontechnical language, the issues with which men and governments struggled during the fateful years after 1941 towards a system of ultimate stability and peace. Special merit attaches to the concluding chapter, *A Sum-*

ming Up, in which the main threads of the story are woven into an excellent interpretative summary, followed by a review of the underlying influences that determined the shaping of economic postwar plans.

AMOS E. TAYLOR

Washington, D. C.

AMERICAN GOVERNMENT AND HISTORY

NOURSE, EDWIN G. *Economics in the Public Service*. Pp. xiv, 511. New York: Harcourt, Brace and Company, 1953. \$6.00.

When the President submits important recommendations to the Congress, they are likely to languish unless expounded and supported by those who in the public eye are his primary advisers in the area involved. That the Council of Economic Advisers should perform this function *in re* the President's Economic Reports was fully recognized by Dr. Nourse when appointed Chairman of the Council in mid-1946. But when the Congress became Republican in 1947, Dr. Nourse told his colleagues that, unless Council members dissassociated themselves from the economic policy recommendations of President Truman, a new Republican President in 1948 might change the membership and that this would make the Council "political." He also argued that there necessarily were "political" overtones in any such presidential recommendations to the Congress and that consequently somebody in the Democratic National Committee rather than "economists" should support these recommendations. His two colleagues, regarding continuity of tenure less important to the successful future of the Council as an institution than trueness to its designated function, disagreed in principle with the Chairman without questioning his sincerity, thus producing the only serious and prolonged split within the Council.

The core of Dr. Nourse's book is a defense of a position which plunged him as Chairman into numerous inconsistencies. Avowing the desire to keep the Council

out of controversy, he publicly indicted his colleagues as "political" for wanting to appear before the Joint Congressional Committee on the Economic Report even during the two years when they refrained from doing so as a concession to him; refusing as a "confidential adviser" to support publicly even those policies he had recommended to the President, he made many speeches implying other disagreements with the President; professing a desire not to embarrass President Truman by engaging in "political" relations, he wrote a letter to Senate Majority Leader Taft in mid-1948 seeking a confidential discussion of Council affairs, and then made contacts with Governor Dewey's group to explore "the future of the Council" if Dewey became President; complaining about being ranked lower than cabinet officers at social functions, he abjured the public responsibilities which cabinet rank necessarily entails.

By late 1949, Dr. Nourse felt frustrated and resigned. His book, written before full recovery of perspective, is designed to demonstrate that, on most problems which arose within the Council, the Chairman displayed not only the practical touch but also moral elevation, while his colleagues were not only unwise but also suspect because they sought to help gain acceptance of policies which they deemed to be in the national interest. Such a book on its face is not a careful study in economics or political science, despite copious excerpts from a "personal diary" to reinforce undocumented allegations.

From early 1950, when the Council assumed responsibilities compatible with its duties, it became a more effective voice in the development of integrated and comprehensive national economic policies. Largely responsive to the Council's stress upon the nation's great economic potential, programs were adopted which sustained a rapidly increasing defense effort and at the same time expanded our general economic capacity and product enough to overcome inflation while maintaining a rising standard of living and full employment. The Council's 1950-53 commitment to "economic expansion," now vindicated by experience and widely accepted, was held up

to ridicule by Dr. Nourse in his first book after his resignation (*The 1950's Come First*), just as in 1948-49 before Korea he had insisted that defense outlays substantially above 13-14 billion dollars a year would be so inflationary as to seriously threaten our economic health. But in a very recent speech, with defense outlays at four times the pre-Korean level, Dr. Nourse fears a disastrous deflation on the ground that our productive power is more than we can absorb.

As to Dr. Nourse's "political" cause celebre, fortunately President Eisenhower has ended it by stating unequivocally that the Council of Economic Advisers should work closely with its counterpart in the legislative branch. And Dr. Burns as the new Chairman has already supported before a Congressional committee recommendations which, presumably after obtaining his advice, the President submitted.

LEON H. KEYSERLING

Washington, D. C.

COLE, WAYNE S. *America First: The Battle Against Intervention, 1940-1941*. Pp. xi, 305. Madison: University of Wisconsin Press, 1953. \$3.50

Salutary reading for an understanding of domestic influences on American foreign policy is provided in this thoroughly documented study of the principal isolationist opinion group of the pre-Pearl Harbor years. The author has drawn heavily on the files of the America First Committee and on interviews. The result is a study noteworthy indeed for the abundance of first-hand material it supplies.

Stranger bedfellows never couched together than the weird company which followed the leadership of General Robert Wood under the broad blanket of America First. Lindbergh and Norman Thomas, Lillian Gish and Philip Jessup, John T. Flynn and Chester Bowles, Coughlinites and pacifists, Bundists and socialists, all used it as a vehicle for their views. Their only common denominator was a foolish notion that the oceans were moats.

Minute in its detail, the study reviews several charges made against the group. The author finds it was little infiltrated by

Nazis (though several German agents did use the organization); it was more guilty of sheltering anti-Semites (though half-hearted efforts were made to disclaim them).

Less satisfactory are the author's conclusions on effects of the America First campaign. He seems to link failure to defeat Administration measures to aid Britain with failure to keep us out of war. Despite his scholarly objectivity, this tends to the view that the Firsters were right in their claim that their principles would have avoided war. In his account of the Committee's tactic of urging a vote in Congress on "the real issue, war or peace" (as General Wood put it), he concludes that the "Committee's opportunity to win the battle against intervention lay in getting the debate on the narrow issue of war or peace. Its inability to do so and the Japanese attack on Pearl Harbor insured the defeat of the America First Committee." Does this equate the propaganda failure of the Committee with Pearl Harbor as a cause of the war? Would a vote in Congress have prevented sailing orders to the Japanese task force? This may not be the author's meaning, but if not his analysis requires sharpening. No criticism is meant here of his excellent research contribution, which is so considerable as to dictate the book's permanent place in the literature of American foreign policy.

OLIVER BENSON

University of Oklahoma

QUINT, HOWARD H. *The Forging of American Socialism: Origins of the Modern Movement*. Pp. xi, 409. Columbia, S. C.: University of South Carolina Press, 1953. \$6.00.

While the Socialist party of the United States of America was not organized until 1901, the socialist activities of the prior decade and a half, from 1886 to 1901, constitute an important and fascinating chapter in the development of the American socialist movement. In *The Forging of American Socialism*, Professor Quint, Associate Professor of History of the University of South Carolina, has presented on a broad canvas a clear, scholarly, and

accurate picture of socialist thought and action during this period.

In his book, Professor Quint patiently reviews the activities in the late nineteenth century of the Socialist Labor Party, the Social Democracy, the Brotherhood of the Commonwealth, the Nationalists under Edward Bellamy, the Christian Socialists, and others, and vividly describes the impact upon the socialist movement of that time of such leaders as Edward Bellamy, Henry Demarest Lloyd, Daniel DeLeon, Morris Hillquit, J. A. Wayland, Eugene Victor Debs, Victor Berger, Meyer London, George Herron, and W. D. P. Bliss. The author also gives a valuable picture of the various ventures of the early Socialists in Populist, Labor, Single Tax, and old party politics and of the relations between the Socialists and the trade union movement of that day.

After reviewing the variety of socialist schools, Professor Quint concludes that "the upsurge of socialism in the United States at that time was only in part inspired by the classic doctrines of the European Marxists." In point of fact, he contends, "it came primarily as a protest against the social iniquities resulting from the tremendous economic concentration taking shape in these hectic years of industrial growth."

While Professor Quint deals separately with a number of schools of Socialist thought, he indicates time and again that it is difficult to pigeonhole socialist leaders into one school to the exclusion of others, since many of them, as was the case with Debs, represented a cross section of many schools of thought.

While the author, in his Preface, dwells on the social injustices of the day as accounting for the development of the socialist movement, he, for the most part, unfortunately leaves these injustices to the readers' imagination. He fails to give an adequate analysis of what constitutes Marxism, and his inferences that advocates of the class struggle necessarily believe in the "malevolent intent of one group of individuals to oppress another" convey a false conception of this theory.

Despite these inadequacies, Professor Quint's volume provides the best and most

authoritative volume on American Socialism during these crucial years that has thus far issued from the press

HARRY W. LAIDLER

League of Industrial Democracy
New York City

ROSSITER, CLINTON. *Seedtime of the Republic*. Pp. xiv, 558. New York: Harcourt, Brace and Company, 1953 \$7.50.

In this book Professor Rossiter has dealt with the development "of the political ideas that sustained the rise of liberty in colonial and Revolutionary America." Holding the view that the ideas of the Revolution were the product of a long process of growth in the colonies, he has devoted over two-thirds of the book to what he calls "The Circumstances" which gave rise to this body of doctrine in the colonial era and to essays of from 20 to 34 pages each on six representative colonists—Thomas Hooker, Roger Williams, John Wise, Jonathan Mayhew, Richard Bland, and Benjamin Franklin.

The circumstances, as well as the ideas, of the Revolution are treated more briefly. And where the topical analysis of the first two-thirds of the book is devoted to conditions and causes—governmental, religious, economic, societal, and intellectual—that method is employed in the discussion of the political principles of the great period of first maturity, 1765–1776.

In a book so organized, particularly one written after long study of the sources as well as secondary materials, it is not surprising that one does not find the free-wheeling quality of Parrington's *Colossal Mind*, but then all too many of that lively author's conclusions were formulated, not only without fear, but also without research. That charge cannot be made against Mr. Rossiter. But it is, I think, fair to say that though his carefully documented book will be invaluable to every future student working in this field, it probably will not be read by very many nonprofessional citizens. And it may also be said that there is relatively little that is new in the book, though many of the comments made in passing are excellent and, at least to one worker in this particular vineyard, highly satisfactory.

If Mr. Rossiter's treatment of the political principles of the Revolution is lacking in the readability possible in a series of essays such as one finds in Parrington, or, in more stately procession, in Tyler, the systematization of Revolutionary ideas which he does provide will be more helpful to the historian of ideas than another group of essays. My only general criticisms of his topical analysis in Part 3 are: first, that some of those discussions tend to leave the impression that there was no substantial change or growth during the Revolutionary years; second, that many of the topical treatments are too brief to be as helpful as they might have been. There were a good many examples of such growth, particularly between 1765 and 1776, but also in the two or three years after 1776, for example, as between the Virginia Constitution of 1776 and that of Massachusetts written three years later. They clearly came from and reflect the same heritage, but they differ in such significant respects as the method of ratification and the application of the principles of separation of powers. What is said about the separation of powers is good, but in two pages (as compared with 20 pages on Hooker or 34 on Bland) the concept could not be given the analysis its importance warrants.

BENJAMIN F. WRIGHT

Smith College

MADISON, JAMES. *The Complete Madison*. Edited by Saul K. Padover. Pp. ix, 361. New York: Harper & Brothers, 1953. \$4.00.

The bicentennial, two years ago, of James Madison's birth brought a new interest in his life and achievements. The most notable manifestation was the monumental biography by Irving Brant, of which three volumes have already been published. The present work is a compilation of most of Madison's significant writings. Its content belies its title, however, for it omits even such important summations as the Virginia Resolutions and the Report on the Virginia Resolutions. Although it will certainly be useful, it would be even more so if less space were given to the Federalist Papers and

more to the role of the courts and the province of government.

The author presents a view of Madison as a "middle-of-the-road liberal." How well this is justified can only be discovered from an intensive reading of all his writings. He was undoubtedly liberal in regard to the suffrage (but so was Hamilton) and on such issues as freedom of the press and subordination of the military to the civil authority. But the author himself admits that Madison's view of human nature was Calvinistic, and that he conceived of government primarily as a device for playing off factions and interests against one another. This is brought out particularly in Madison's ideas on freedom of religion. "Is a bill of rights a security for religion?" he asked, and answered by saying that the religious freedom enjoyed by Americans "arises from that multiplicity of sects . . . which is the best and only security for religious liberty in any society." "Divide et impera," he declared, is, "under certain qualifications, the only policy by which a republic can be administered on just principles." His attitude toward coercion as the essence of government was essentially Hamiltonian, and his position on the tariff would seem to be a shade less than middle-of-the-road liberal. He had scarcely been inaugurated President when he urged upon Congress the enactment of laws that would "more especially protect and foster the several branches of manufacture which have been recently instituted or extended by the laudable exertions of our citizens."

No one who wishes to understand the theory underlying our constitutional system can afford to neglect Madison's writings. Spokesman though he often was for the forces of order and stability, he nevertheless evolved a number of doctrines readily adaptable to liberal purposes. Dean Padover's book is a valuable contribution to an appreciation of Madison's achievement.

EDWARD MCN BURNS

Rutgers University

BOORSTIN, DANIEL J. *The Genius of American Politics*. Pp. ix, 202. Chi-

cago: University of Chicago Press, 1953 \$3 25.

The author of these lectures has spent a year abroad as a Fulbright beneficiary in Italy. His experience in talking about the United States to Europeans and in listening to the Voice of America have given him concern. We are not understood abroad, and we are not remedying this lack of understanding by our efforts to explain democracy to the world. He believes that we are hamstrung by our effort to broadcast a theory of politics when we have none and by our attempt to extend democracy in places where it can't exist. This book is designed to show why we have no political theory and are therefore impotent in ideological warfare, and to advise us to adopt revised attitudes toward the rest of the world based upon more realistic understanding of ourselves.

We have no political theory, he maintains, because we have never needed any. Our ancestors came to an almost uninhabited wilderness, and their institutions were shaped by what they knew and what their environment made it necessary for them to do. Metaphysics was not necessary. In several penetrating chapters Boorstin shows that our most divisive experiences, the Revolution, the Civil War, our religious differences, and our two-party system have never stimulated any conflict of theory. There has always been basic agreement as to underlying values. The Revolution was just a quarrel over the proper interpretation of the British Constitution. The Civil War was just a conflict over the correct operation of the Federal Constitution. Religiously and politically our disagreements do not arise out of any doubts about the need of religion or any change in the system which the two parties guide, but over ways and means of operating the accepted. In other words, we always take the basic values for granted and consider our institutions as continuous and without need of radical change.

Now, however, our new position in this bad new world of the twentieth century has brought us face to face with European ideological warfare, and we have become hypersensitive because of what Europeans

say about us and because of the designs they have upon our wealth and power. So we have begun to fight back, and, in so doing, seek a theoretical weapon which we haven't got, and expect other people to become democratic and fight for democracy. Boorstin's remedy is self-study; let us really understand that we became what we are because of our migration to this peculiarly rich and empty continent, and then let us stop trying to remake the world in our own image, with our own money. He believes that while we are seeking this self knowledge, we should defend ourselves and not pay heed to what demoralized Europe is saying about us.

Regarding the first thesis, that we have no political theory, it may be presumed this depends upon how theory is defined. While we may not have a fine-spun metaphysical system of concepts, I believe we have a reasonably well-defined theory of political behavior which serves the same purpose. The historical analysis of our political attitudes which Boorstin uses, on the other hand, is well worked out and convincing. As to the mistakes we are now making in our attempt at ideological warfare, most of them must be admitted. Let us hope that those who are making them will read this book and profit by it. In the meantime, our chief concern should be to continue to conserve and improve our own achievement. It is unique. If this smacks of intellectual isolationism, I presume the author would say, "Make the most of it."

ROY F. NICHOLS

Philadelphia, Pennsylvania

LILIENTHAL, DAVID E. *TVA: Democracy on the March*. Pp. xxiv, 294. Twentieth Anniversary Edition. New York: Harper & Brothers, 1953 \$3.50.

Ten years ago Chairman Lilienthal discussed the Tennessee Valley Authority in a book which subsequently crashed the pocketbooks market. This volume adds another decade. Chairman Lilienthal can now be called "Mr.," and his present volume, besides recording the significant changes which have occurred in the Valley, maintains a candor which the bureaucracy would not permit even to a chairman. Mr. Lilienthal now speaks of senators by name; his

writing occasionally is more flatly assertive than it formerly was.

Perhaps the most important new section of the present edition is the new preface, in which Mr. Lilienthal seeks an answer to the question: why are there no more TVAs in the United States? The answer lies, the author believes, in the determined opposition of the Washington bureaucracy—bureaus in the Departments of Interior and Agriculture and the Army Corps of Engineers. The whole book is an argument for the TVA concept of centralized authority and decentralized administration. Although the argument may be put too one-sidedly in this volume, the reviewer believes it to be basically sound. But we must look further than the Washington bureaucracy for an explanation of the failure to use the idea elsewhere. Mr. Lilienthal too greatly discounts local opposition to the Authority idea in other regions. The Washington bureaucracy could not hold the line if Congress really wished to use the form elsewhere.

Mr. Lilienthal's second edition appears at an opportune time, for TVA faces tough days ahead. The "General," who carried Tennessee after a campaign studded with public assurances of regard for TVA, has, after inauguration, applied those dread words, "creeping socialism," to the organization. In the current Congress, the resources funds of the agency were partially rescued only at the late stage of a Senate floor fight. TVA needs to produce more power, for with hydro plants it started something in the South which now requires more steam plants. Congress is proving reluctant at this point, although the power operations of the Authority are paying off handsomely enough. The South is concerned that the great change to an urban society, which Mr. Lilienthal chronicles, may be hampered by the present Administration. The people of the Valley have every reason to hope that the Anniversary Edition will be widely read outside the Valley.

LEE S. GREENE

University of Tennessee

MCCONNELL, GRANT. *The Decline of Agrarian Democracy*. Pp. 226. Berkeley:

University of California Press, 1953. \$3.75.

This interesting, well-written, and well-documented book might have been more descriptively entitled, "The Rise of the Farm Bureau." The introductory argument is that agrarian democracy of the type associated with the names of Thomas Jefferson and John Taylor and of the type reflected by the Populist Movement of the 1890's has declined. In fact, it is concluded that the agrarian democracy has "gone from our scene."

Nineteenth century agrarianism with its broad political base, distrust of power, and largely economic sources of discontent is contrasted with a rise of a structure of political power during the first half of the twentieth century which is based on farm organization. The revival of farm organizations during the first two decades of the present century was during a period of upswing in the business cycle. The changes from nineteenth century agrarianism "implied a narrowing of the public interests of organized agriculture; each involved a sharper conception of farmers as a particular class."

Mr. McConnell's main emphasis is on analysis of the development of the present structure of power within agriculture. Attention is concentrated on the interrelationships among the United States Department of Agriculture (particularly the Extension Service), the Land-Grant colleges, and the American Farm Bureau Federation. The Farm Bureau Movement is described as a "direct outgrowth of the county agent system." Farm Bureau activities during the "trial-and-error" years of the farm bloc, McNary-Haugenism, and the Federal Farm Board are analyzed along with those of the "success" period of the 1930's. The "successes" of the Farm Bureau are related to the 1933 Agricultural Adjustment Administration (AAA) and its 1936 and 1938 successors.

Mr. McConnell traces the development of the Farm Security Administration as an agency interested in what is today often referred to as the "welfare" aspects of agricultural policy (as opposed to the "production and price" aspects).

A chapter entitled "Attack" presents his

interpretation of American Farm Bureau Federation attitudes toward the Farm Security Administration. The Farm Bureau is given full credit for the "death" of FSA while administrative organization was "the crux of the entire battle." A succeeding chapter is devoted to other Farm Bureau "maneuvers" in "the large campaign" which were directed at the land-use planning system, the Bureau of Agricultural Economics, and the Soil Conservation Service.

In an analysis of the rationale of organization of the Farm Bureau, Mr. McConnell concludes that the basic policy is one of self-preservation of the organization.

Some of Mr. McConnell's charges may seem to be severe to many directly concerned with agricultural policy formation and program administration. However, there will undoubtedly be agreement that he has made a real contribution to the understanding of the power structure in agriculture.

W. N. THOMPSON

University of Illinois

TAYLOR, CARL C. *The Farmers' Movement 1620-1920*. In "American Sociology Series." Pp. vii, 519. New York: American Book Company, 1953. \$5.50.

This book adds another volume on rural problems to the American Sociology series—in addition to Lowry Nelson's earlier one on *Rural Sociology*. Its overall theme is that the economic and political revolts, upheavals and efforts at organization of American farmers during three centuries have been no more than episodes in what the author calls the farmers' "movement." Although there has admittedly been no real consistency, coherence, group solidarity, or common structure in the multitude of episodes, Dr. Taylor defends his concept of "movement" by the need for some term and some concepts by the use of which one can classify and make meaningful such phenomena.

The book contains a historical sociological survey on a long line of farmers' protest actions, revolts, organizing efforts, and movements. These phenomena are the multiple counterpoint to the Leitmotiv of rising American capitalism. Veering at times toward agrarian socialism and other ideologies, they have contributed a good

deal to the evolution of constructive thought on political and economic reform and to the nation's ideas about agricultural policy.

As such a survey, on the longest secular run, the book is a highly welcome contribution. It is well documented, written in a lucid style, and with full command of the vast literature on the subject. Its straightforward brevity brings the often highly dramatic features of movements and actions to the fore and keeps the colorful story interesting to the very end. Well selected evidence from newspapers and journals of the time reveals the prevailing ideas and arguments. The epic quality probably rests to some degree on the unconcealed and warm partiality of the author to the cause of the farmers in their struggle for equity against monopoly, corrupt politics, and unfair advantage of other vested interest groups.

Inevitably the main body of the book is devoted to the period 1850-1920, and the account of stirrings in the preceding 230 years is very brief. Yet the analysis of Shay's Rebellion of 1787, the Whiskey Rebellion, and Fries Rebellion and the particularly well written analysis of the panic of 1837 and its aftermath are an excellent prelude. It leads up to the dramatic history of the impact of Civil War inflation and its succession of agricultural expansion, depressed prices, and other economic hardships for decades to come.

The reader will find a concise and well written brief history of every important farmer movement of the United States and become familiar with the specific economic circumstances as well as the grievances of the farmers and their main ideas of protest or reform and the success and failure of their action. The bibliography, the result of 35 years of the authors' continuous interest in the subject, covers it thoroughly.

KARL BRANDT

Stanford University

MERRILL, HORACE SAMUEL. *Bourbon Democracy of the Middle West, 1865-1896*. Pp. xi, 300. Baton Rouge: Louisiana State University Press, 1953. \$4.50.

In spite of the hundreds of volumes written on the subject, most of the political

history of the period from the Civil War to Bryan remains to be written. Until state and regional histories meeting the requirements of modern scholarship are produced, the larger task of synthesis must be held up. Those who despair of the length of time we must wait can take comfort from the publication of such works as C. Vann Woodward's *Origins of the New South, 1877-1913* and the present volume.

Merrill's basic idea is that the leadership of the Democracy was in the hands of Bourbons, "wealthy, self-esteeming, self-appointed guardians of an already fixed pattern for living and making a living." The Bourbons of the Middle West were not so much interested in winning elections as they were in keeping their party safe and sane through denying power to dissident farmers and wage earners. There was some truth in General Weaver's remark that the party "has simply camped every four years exactly where the Republican party camped four years before."

It may well be that distrust of the Democrats on the part of agrarian radicals of the present day is in part a consequence of the reputation built up in the Middle West by the party under such leaders as J. Sterling Morton of Nebraska and William F. Vilas of Wisconsin. It was Morton who said that *The Wealth of Nations* was "to political economy as the New Testament is to the Christian religion," and it was Vilas who invoked the divine right of loggers: "That no reproduction of the valuable pine takes place, a worthless species only springing up in its stead, seems a pregnant testimony that the purpose of this great provision was for temporary uses, more durable mineral material being substituted in after-developed prosperity."

Merrill is a lively controversialist as well as an able historian, and he does not try to hide his glee when the Bourbons finally lose control of their party in 1896. "During the second Cleveland administration," he notes, "the Bourbon Democracy outdid itself in effrontery and finally collected its just reward."

Based solidly upon manuscript collections, chiefly in the libraries of the State Historical Societies of Wisconsin and Minnesota, the book is attractively designed and

complete with a full, excellent index. Merrill has produced both a major contribution to United States history and an eminently readable book.

ROBERT E. BURKE

University of California
Berkeley

SUMMERS, FESTUS P. *William L. Wilson and Tariff Reform: A Biography*. Pp. xi, 288. New Brunswick, N. J.: Rutgers University Press, 1953. \$5.00.

On February 1, 1894 the Wilson Bill making substantial reductions in American import duties passed the House of Representatives by a vote of 204 to 140. After twelve years of struggle against the forces of protectionism as representative of a West Virginia constituency, Wilson, Chairman of the Ways and Means Committee, was the leader of a triumphant Democratic majority. This was the climax of his career. His party, controlling both executive and legislative branches, seemed after a generation of defeat and frustration to be in a position to reverse the postwar protectionist trend. But in the Senate high tariff Democrats joined with Republicans in a "criminal operation" which completely changed the character of the Wilson Bill. Their 600 amendments made it moderately Protectionist. In disgust, President Cleveland allowed it to become law without his signature. Wilson, his hopes blasted, his health wrecked, soon came to the end of his political career. Defeated for re-election, he was appointed Postmaster General. In 1897 he was named President of Washington and Lee University, a position he held until his death three years later.

Dr. Summers' scholarly book is based largely on Wilson's diaries and correspondence and on the papers of his contemporaries. He has given us a portrait of a high-minded public servant, a gifted scholar, and a persuasive orator battling to the limit of his powers against forces too strong for him. The book presents also a revealing, well-documented view of national and local politics in a turbulent era of American history.

PERCY W. BIDWELL

New York City

NEW YORK CITY. *Modern Management for the City of New York: Report of the Mayor's Committee on Management Survey*. 2 vols. Pp. xvii, 307; x, 876. New York, 1953. No price.

Luther Gulick had courage to undertake this survey of a government the size and complexity of which is second only to that of the United States government itself. He was faced from the beginning with a series of political changes complicating a huge assignment which was already difficult enough from a technical standpoint. The resulting report is an important document and can teach us much of the science and art of how to study municipal government and effect improvements therein.

The general recommendations call for greater decentralization in the departments of government in this vast public service; the development of the central government as a management directorate; a clearer definition of the departmental functions; a modernization of the personnel administration and of the budget; relief to an overworked mayor as chief executive with a director of administration to assist him, and a public relations officer to institutionalize what used to be known as the "Grover Whalen" function; strengthening the Board of Estimate; strengthening of the other management co-ordinating agencies; modernization of the internal organization of the departments; standardization and modernization of executive salaries; enlistment of the aid of qualified committees, and the provision of adequate funds, manpower, and office space to accomplish these objectives.

Perhaps the recommendations for a reorganization of the mayor's office through increased staff to assist him in his impossible combination of roles is the most important, although the financial recommendations and a more economic rate structure for the transit system must be given high priority. Eventually the City of New York will have to reconsider the structure and functions of its unique Board of Estimate more critically than in any study made to date.

The question still to be answered is whether the dose prescribed is digestible, or whether this type of survey may not

arouse so many resistances at once that the recommendations—even the best of them—tend to cancel each other out. There is the further question whether the outside survey by battalions of experts handing in a public report is any longer the most effective method of governmental managerial reform. Is it not preferable for the outside consultant to work long enough on the inside to develop from within the will and the skill for change and improvement—wills and skills without which very little may happen to correct managerial ills.

Public management surveys can be judged only over a period of time. A fair appraisal of this one will have to wait for at least five years to determine whether sick old Father Knickerbocker has seen fit to follow some of the prescriptions. In spite of the Cassandras who have repeatedly prophesied that Megalopolis on the Subway would die of its own gigantism and that it was on the brink of decay, dispersion, suffocation, and bankruptcy, there is still hope for a patient who can command so many able consultants and who has survived so many past crises.

HERBERT EMMERICH

Public Administration Clearing House
Chicago, Illinois

CROSS, HAROLD L. *The People's Right to Know: Legal Access to Public Records and Proceedings*. Pp. xxiv, 405. New York: Columbia University Press, 1953. \$5 50.

This is a lawyer's brief prepared for the American Society of Newspaper Editors. Despite an elaborate apparatus of scholarship, which includes over a thousand notes inconveniently assembled at the end of the text, appendixes, a classified bibliography, and an index, the work is not a presentation of the results of scholarly research. In fact the author practically admits in his preface that it "is something of a call to battle, with some sacrifice of neutrality and objectivity."

Nevertheless, the data assembled, though not very well organized, will have some value to students of American history and of sociology and to those interested in

"public records" in general. The term "public record," which appears frequently in the book, is always used in the sense of government records that are or, in the opinion of the author, ought to be open to inspection by the public, especially by newspapermen, and never in the sense of publicly owned records. Considerable attention is devoted to definitions of records, but the author is interested in definitions in statutes pertaining to records administration only to the extent that they may be used in connection with questions of accessibility of records, especially current records, to newspapermen.

The author finds the situation, from his point of view, much more satisfactory as respects state and local than federal records, and he is much concerned over the fact that, in many cases, the heads of federal agencies decide what records are suitable for public inspection. From the point of view of the research scholar, the archivist, and the records administration, the situation is reversed—by and large, federal records are better administered than are state and local records. Moreover the mere right to inspect records is of little value if the records desired are non-existent or cannot be found.

The author devotes five chapters to discussion of federal records and statutes and regulations pertaining to them, but he makes no mention of the Federal Records Act of 1950 (Title V of Public Law 754—81st Congress), which requires the heads of agencies to "cause to be made and preserved records containing adequate and proper documentation of the organization, functions, policies, decisions, procedures, and essential transactions of the agency and designed to furnish the information necessary to protect the legal and financial rights of the Government and of persons directly affected by the agency's activities" (Sec. 506. a). No mention is made either of the definition of records originally incorporated in the Records Disposal Act of 1943 (44 U. S. C. 366), which has been given more general application by the Federal Records Act of 1950 (Sec. 511. a).

SOLON J. BUCK

Washington, D. C.

RAGER, EDWARD. *The Rat Race*. Pp. 288. New York: Vantage Press, 1952. \$3.50.

This book is an interesting and a stimulating discussion of New York city and state politics. Fortunately, the discussion is cast in the form of a novel. The word "fortunately" is used advisably since the discussion if it were not presumably fictitious would be libelous on almost every page.

The characters in the cast are thinly disguised representations of very important people in New York state and city politics. The machinations of these characters at the hands of Mr. Rager are lecherous, illegal, and wondrous to behold. It should be added that there is a substantial amount of opinion that Mr. Rager's descriptions of New York politics and its goings on are not far from the truth. If anything, it is probable that he has avoided telling the truth, the whole truth, and nothing but the truth.

Mr. Rager, an attorney, joined the Republican party in New York city in 1926 in the hope of destroying the Tammany machine. As chairman of the committee for prevention of election frauds, he fought illegal voting for years. In 1937 he became recording secretary of the National Republican Club and editor of its Bulletin. Mr. Rager gave up this work in 1947 after his election to the New York City Council. Shortly thereafter he decided that the best way to defeat bossism was not in making sporadic speeches and newspaper headlines which are easily forgotten, but through novels which would hold the reader's interest and convey the lessons of politics to the public.

The Rat Race is the first of these novels.

As a novel *The Rat Race* has the distinction of holding the reader's interest, particularly the reader who is concerned with New York politics. Nevertheless, it is apparent that Mr. Rager is not primarily a novelist but an attorney and a political reformer. Despite a very marked effort to inject into the book the customary ingredients of the novel, the pages still give the impression of being largely an attempt to conduct a political discussion.

There is, however, a substantial portion

of earnestness in the book which makes for a large amount of interest, and perhaps this is due to the fact that Mr. Rager has drawn so much on his own life and experiences for the material which he presents.

It is apparent that Mr. Rager is no Charles Dickens. Nor is this book likely to result in any major reforms in politics as practiced in New York City. Nevertheless, it is full of shrewd insights and should prove to be an eye opener to those of the political lathy who read it.

W. C. CLARK

Syracuse University

ECONOMICS AND INDUSTRY

BOWEN, HOWARD R. *Social Responsibilities of the Businessman*. Pp. xii, 276. New York: Harper & Brothers, 1953. \$3 50.

Within the past quarter century much has been written and many lecture platforms eloquently held to analyze our economic structure in terms of satisfying the common weal. Dr. Bowen's book provides a fine summarization of these approaches and opinions of many businessmen, religious leaders, and community experts.

On the premise that the vast majority of the American people are purposely and determinedly wed to our system of free enterprise and the exercise of the right to private property, this book addresses itself to the several hundred largest firms in this nation as "vital centers of power and decisions" touching the lives of our people at many points. Much responsibility is therefore placed upon them, not only in setting patterns of practice in relation to profits and competitive standards, but in labor-management relations and the solution of social problems as well.

A report prepared under the sponsorship of the National Council of Churches of Christ, it is fair and reasonably thorough in its representation of what has already been accomplished by the businessman and the industrialist. But, almost uniformly, it asserts that these accomplishments have been promoted principally in the spirit of self-interest and protection of profits rather

than through the presence of higher motives. At the same time, the pages of Dr. Bowen's work are filled with statements, extracts of speeches, and examples of accomplishments by American industry establishing standards of social justice apart from any immediate or direct return to the firms or individuals involved.

A constant problem in the search for solutions of socio-economic problems has always been the part which government should play in regulation or supervision of industry and business. In this instance, our author establishes an area of proper interest by government, not as a competitive force with labor and industry but as the representative of the general welfare of all.

There is wide agreement on the propriety of this function of government among economic leaders throughout the free world. John Maynard Keynes has expressed himself in that "a high level of private business activity is compatible with a government that assumes power over fiscal policy . . . to become an ally rather than a foe of the private businessman." He points to government serving as a stimulant of private investment as "the one way of avoiding the destruction of economic forms . . . and as the condition of the functioning of private industry."

Dr. Bowen does not attempt to define government's role in any terms as specific as these. Rather, he sets forth clearly and well several channels for the review and correction of our economic ills to the exclusion of communism and amoral materialism. Here government is suggested as a restraining force in an economy built on voluntary assumption of social responsibilities by businessmen. It is to be hoped that future volumes in this study will define equally well the obligations of other areas of economic and social activity including labor, small business, education, and more general civic forces.

The book is a good review of our problems and might well be studiously read by those who now lead our business and social thinking and those who aspire to do so.

ALBERT M. GREENFIELD

Philadelphia, Pennsylvania

VINER, JACOB. *International Trade and Economic Development*. Pp 154. Glencoe, Ill. The Free Press, 1952. \$2 75.

This series of lectures delivered by Professor Viner at the National University of Brazil in 1950 is a vigorous restatement of the truths of the classical economists and their application to the theory of foreign trade. Mr. Viner does not pretend that economic theory must not be relevant, and he accepts the necessity for bringing the classic theory of foreign trade into relation to the facts of our contemporary world, which it admittedly no longer fits. He has some lucid and pointed criticisms of the theories of Keynes which deserve noting as they bear on the same point.

Some of the most interesting passages in this little book, which probably were not well received by his South American audience, point out the fallacies of equating all agricultural economies with poverty and industrialization with high national per capita income. There are some excellent analyses also of the qualitative, as well as quantitative, differences in the contribution of what the classical economist used to call "labor" to efficiency and, hence, to cost. Perhaps these do not go quite far enough in the consideration of the factors of social rigidity, the prerequisite of large-scale markets within a single fiscal system, and the intangibles of management ability. Professor Viner recognizes these in some degree, though often a little obliquely.

In his lecture on "The Influence of National Economic Planning on Commercial Policy," he might have reinforced his case against even the indirect contribution of Keynesian theorists. This would have served to supplement the strong case he makes against national economic planning as breaking up the flexibility of adjustments on which the classical theory of international trade and most of our basic world economic development depended in the nineteenth century. There are psychological factors, unchained by Keynesian steps, which often lead to cumulative effects, then to having to compensate against the initial remedy, and so to destroying such natural factors of adjustment as might otherwise come into play. Quite apart from Keynesian remedies, the rigidities

which are induced by politically easy, and sometimes economically fatal, limiting effects through a social security system like that of France; and perhaps even like that of England, make the ordinary rules of capitalistic economies almost impossible to apply in their fundamentals.

The deeper difficulty with Mr. Viner's proposals, however, is that he recognizes only in a marginal way—though he admits, theoretically—the overwhelming power of politics, in the broadest sense, to warp economies for reasons that lie beyond mere human nature and political pressures. In the discussion that Mr. Viner engaged in with several of us at the Princeton Bicentennial meetings, the basic issue was whether or not a struggle between what now is called the free world and Moscow would not force a complete revision of economic policies to fit into new assumptions about national security involving the issue of survival itself. Countries like Brazil are under the pressure today not only of their natural desire to industrialize, at least on a primary basis; they have behind them the compulsion of memories induced by shipping shortages and the inability to get manufactured goods from a world at war. More than that, they are confronted by the prospect that a world at war again may see so great a destruction of the industrial economies that no nation will be left as intact as was the United States, even if one could be found willing to assume the burden of Atlas, through largesse, on a world scale necessary for reconstruction after atomic war.

Professor Viner himself is willing to consider the need for international lending organizations to take counter-cyclical steps. His remarks about the genuine merits of the classic economic theory, alas, apply only to conditions which make it possible or sound. He himself sees how far they are from thinking relative or applicable to a world such as we confront today. Security policy completely dominates trade policy to a degree unique in modern times.

One can only feel that, by limiting his economic analysis to rules that in the main *cannot* apply, Professor Viner has been more nostalgic than presently helpful. But the exercise brings out many of his

usual lucid and telling points in exposing the "quack" character of some familiar nostrums. The difficulty is that the learned medical practitioner who admits to having no real remedy is apt to be passed over for the quack in times of desperation!

WILLIAM Y. ELLIOTT

Harvard University

MEADE, JAMES EDWARD. *A Geometry of International Trade*. Pp. 112, plus pamphlet. London: George Allen & Unwin (distributed in the U. S. by The Macmillan Company), 1952. \$5.00.

The use of geometry has long been common in the exposition of the theory of international trade. Professor Meade has systematized and extended the geometrical exposition of such topics as the advantages of free trade, the effects of various (increasing, constant, and decreasing) cost conditions, the impact of taxes and subsidies, and the relationship between a trade deficit and the rate of exchange. These situations and problems are represented in 51 diagrams that are contained in a little pamphlet found in a pocket in the back cover of the book. The entire text is given over to a description of the diagrams.

The diagrams are ingeniously constructed, and, what is perhaps rarer, they are clearly drawn and lucidly explained. The basic diagrammatic device that is employed links the quantities exported and imported to domestic consumption and production. (Since two-commodity, two-nation trade is assumed, the diagrams are of the ordinary two-dimensional variety.) Indeed, domestic production and consumption as represented by transformation and indifference curves, respectively, are the starting points. From these are derived the whole apparatus of quantities traded, domestic prices, offer curves, terms of trade, and so forth.

Books dealing with geometry are not usually intended for the general reader, and this one is no exception to the rule. The orientation of the work is toward the exposition of the problems through the use of geometrical analysis rather than toward the application of trade theory to the current problems of the real world. As the author states in the preface, the book aims more at a technique of analysis than

at the solution of real problems. It should be mentioned, however, that the selection of topics was obviously made with the world's practical problems uppermost in mind. This probably reflects the origin of the book. The author indicates that the book is an outgrowth of the diagrams that he worked out for his own use in the course of preparing a more general work entitled *The Theory of International Economic Policy*. The first volume has appeared under the title *The Balance of Payments*. The well informed non-technical reader who seeks an authoritative statement of the contribution that theory can make to the world's present imbalance should consult this more general book rather than the author's geometry. The specialist in international trade theory, however, will find this little geometry a valuable addition to the literature.

IRVING B. KEAVIS

University of Pennsylvania

BUTTERS, J. KEITH, LAWRENCE E. THOMPSON, and LYNN L. BOLLINGER. *Effects of Taxation. Investments by Individuals*. Pp. xxxiv, 533. Boston: Harvard Business School, Division of Research, 1953. \$6.25.

This study is the fifth and last in a series conducted through the Harvard Graduate School of Business Administration on the effects of taxation. Its four predecessors dealt with the effects of taxation on inventory accounting and policies, on corporate mergers, on executives, and on executive compensation and retirement plans.

The problem to which this book is addressed is a fiscal one. Its solution, and the greater part of the book, however, turn on the subject of the distribution of wealth and income in the United States—what proportions of the population own and receive what proportions of the country's wealth and income. After presenting and analyzing data on this subject drawn from a number of sources, the authors establish the proposition, long generally accepted in nonprecise form, that a substantial proportion of investable wealth and income is accounted for by a minute fraction of the population. This minute fraction is an

important source of equity and venture investment. It is not the only, or even the most important, source; ploughback of business profits outweighs it.

Progressive income and estate taxes cut into the capacity of this group to make equity and venture investment, but are far from obliterating it. For one thing, "effective" progression on large incomes is much milder than commonly supposed, because of the effectiveness of various tax minimization procedures. The investment policies of this group of investors is influenced to a considerable extent by tax considerations—the severity of upper bracket income tax rates, the favorable tax treatment of capital gains, the estate tax. But these tax effects operate both ways—toward greater conservatism with some individuals, toward greater venturesomeness with others. There is a slight balance of conservative effect.

The author's conclusion is that our tax system has some effect in reducing equity and venture investment, but less than had generally been surmised. The reduction of the capacity of the upper wealth and income groups to invest is more significant than the influence of taxes upon their policies.

The authors find that the tax-exempt holdings of the wealthy are smaller than might have been anticipated, but they note the expansion of the volume of such securities as a potential threat, under high tax rates, to sound national investment policy. They confirm the opinion that the capital gains provision of the federal income tax tends to accentuate security fluctuations, especially on the up side.

In this book the reader is overprovided with summarizations. There is a four-page "Abstract" as a cover insert. The first fifty pages are a summary of the book. Each chapter carries a one- or two-page "Conclusion." All of these summaries are beyond question helpful to a running reader, but they make for repetition, and are a temptation to jump the body of the chapters.

The body of the book tends to be too much a coverage of the worksheet stage of the study, an account of the research done rather than of the results. Still, the

materials and tabular data presented in overabundance will be a mine that can be profitably worked by students in many fields besides Public Finance.

WILLIAM J. SHULTZ

College of the City of New York

SAYLES, LEONARD R., and GEORGE STRAUSS.
The Local Union: Its Place in the Industrial Plant. Pp. xv, 269. New York: Harper & Brothers, 1953. \$3.50.

The vast literature dealing with the American labor movement contains relatively little that is concerned with unionism at the local level, and much of what exists is of indifferent quality. Sayles and Strauss, of the New York State School of Industrial and Labor Relations at Cornell, now help to fill this gap with publication of a volume based on intensive study of seven locals and less thorough observation of thirteen others.

The Sayles-Strauss research focuses on three areas in the internal life of the local union—the grievance process, the officers and stewards, and problems of union democracy. The authors prove themselves to be keen observers, with considerable insight into the complex of forces that shape union policy and with an appreciation of the effect of factors such as changing relations with management upon the internal life of the union. The volume contains a number of shrewd observations upon such matters as the decline of the steward's position as union-management relations improve, the criteria used by union officers in the selection of grievances, the social characteristics of union officers, and the differences between union-leaders and inactive members in the attitude toward union activities.

Methodologically the volume is not precise, as the authors frankly admit. The twenty cases that were studied, representing small and moderate-sized locals in a variety of industries, were located in four northeastern communities, and the authors relied for their material on observation, informal discussion, more formal interviews, projective tests, and documentary data. The authors point out that the selection neither of locals to be studied nor of workers to be interviewed was determined

on a random basis; they are tentative and exploratory in their judgments, and carefully note that they are raising questions rather than providing proof. In the judgment of this reviewer the methods employed are defensible in the present stage of very limited knowledge about local unionism, though more attention must be paid to methodological problems if our knowledge is to continue to advance.

The volume is a stimulating and provocative one, that adds substantially to our knowledge of local unionism. It should prove of considerable value as supplementary reading in courses in industrial relations; and the authors' generalizations, often framed tentatively in the form of hypotheses for further study, should stimulate others to attempt more precise studies and so build on the foundation that Sayles and Strauss have so competently helped to lay.

JOEL SEIDMAN

University of Chicago

BOWEN, E. R. *The Cooperative Road to Abundance*. Pp. xiii, 169. New York: Henry Schuman, 1953. \$3.00.

This is a strong plea for the further development of Co-operation with a capital C, supported by ethical, economic, and scientific arguments. Although the author claims (p. 105) that "we do not have to change human nature" to bring about this development, the verb "should be" is much more conspicuous than "is" throughout the book. "Simply let social human nature develop and suppress our selfish natures" (p. 105) does not seem so simple to this reviewer.

The author insists that competition has failed to result in either efficient use of resources or equitable distribution of product. Moreover, it not only has proven economically unsound, but it is ethically and morally vicious. "Competition is simply to declare war" (p. 81) is quoted with apparent approval. Still further, the competitive system appears to be on its way out. "The first half of the twentieth century saw the full flowering and the collapse of the competitive system. Since 1929 this system has been kept alive by

infusions in the form of subsidies from the public purse" (p. 39). The reasons for the collapse are summarized under six headings: the system is unstable, unjust, inefficient, undemocratic, leads to dictatorship, and to war (pp. 44-48). It is implied that a change in the order of our thinking from Liberty, Equality, Fraternity, to Fraternity, Equality, Liberty (p. 17) is on the way, will further reduce the role of competition, and will lead to a better social order under Co-operation.

One of the interestingly provocative sections in the book is the parallel comparison of the old pro-slavery arguments with the present pro-competition arguments (pp. 69-72) grouped as economic, political, moral, scientific, and general. The conclusion: "time may prove that the arguments which are used today to support our economic system are as false as were the arguments formerly used to support slavery" (p. 72). Certainly some of the points listed will already be branded as sophistries.

The author is unrealistic at times. For example, he says that with an ideal economic system "everyone would be able to choose the occupation that would best satisfy his desires" (p. 11). This seems to imply the belief that somehow the total of our desires to produce would nicely match our total desires to consume. But perhaps too many of us would choose to be like Ferdinand the Bull as producers while we were gourmands as consumers. Or perhaps I am the best mountain climber ever born, but I just do not like to climb mountains. What is the "ideal" economic system (Co-operative or any other) going to do about it; get along without the most efficient mountain climbing—or do I climb? Fantastically complex decisions as to who will do how much of what will always need to be made, and perhaps the old adage that where McGregor sits, there is the head of the table will continue to suggest how the decisions will be made under any system of political economy.

Someone sagely has said that the only failure of the Christian doctrine is that it never has been tried. If nearly everyone really lived the eleventh commandment "that ye love one another," Co-operation might really flourish. But we seem to love

ourselves and our immediate groups first, with only a modicum of somewhat arrogant compassion for people generically. With all respect for Mr. Bowen, I am afraid the triumph of Co-operation does require a change in human nature, at least a change in the balance between the force of personal ambition and greed on the one hand and the mutual love for mankind on the other. If and when that change matures, the details of the system of political economy will be relatively unimportant.

ROLAND S. VAILE

University of Minnesota

SOCIOLOGY AND EDUCATION

REDFIELD, ROBERT. *The Primitive World and Its Transformations*. Pp. xiii, 185. Ithaca, N. Y.: Cornell University Press, 1953. \$3 50.

Finding his inspiration in the writings of Childe, Braidwood, Toynbee, and Whitehead, Dr. Redfield searches for a few universals around which to weave a simplified but suggestive account of the history of the human race, much as did the earlier "fathers of anthropology." He aligns archaeology, history, and anthropology to bear upon two principal problems: First, "What can be said that is general and true about the condition of mankind before civilization?" Second, "What were the transformations which turned folk society into civilized society?"

He finds that archaeologists have been able, from their study of material remains, to piece together a picture of the small, homogeneous communities of precivilized society, which largely supports the notion of the "primary condition of mankind" obtained by anthropological studies of present-day primitive peoples. Emphasis is placed on the food-producing and urban revolutions as most fundamental in bringing about civilization, with perhaps greater significance attributed to the latter. He attempts to view history "from the bottom up" instead of becoming involved in the often dazzling theories of Toynbee, Spengler, or Sorokin. He seems to rely largely upon the old comparative method in an-

thropology which still proves provocative.

The author has profound respect for the power of the "moral order" over the lives of men, stressing the claim that the early societies were held together, as are present primitive groups, by largely undeclared but continually realized ethical concepts. He does not feel that the moral order has diminished since the coming of civilization, but rather that its character has changed. With the binding together of larger and larger units, it has become more independent, and in itself an agent of change. "It is the spirit of reform, the making of man's world by man's design, which makes civilization so different a thing from pre-civilized living."

This book does not claim to be a finished product or a final answer to any of the fundamental issues raised; but it is a stimulating experience to share his thinking as this writer comes to grips with them in his sincere and profound way. There is throughout a simplicity and human touch about the man that captivates the reader. While Redfield suggests that we do not want ethnologists so balanced that they lack humanity, in him we find both humanity and balance.

CAROLYN ZELENY

LEO W. SIMMONS

Yale University

RADIN, PAUL. *The World of Primitive Man*. Pp. xi, 372. New York: Henry Schuman, 1953. \$5.00.

Dr. Paul Radin's new book cannot be summarized, still less criticized, in 400 words. One of its interests and values, to specialist and layman alike, is its insistence (renewed and somewhat extended from earlier books of Radin's), that aboriginal or primitive man was (and is) a many-sided and competent man: competent technologically, politico-socially, and philosophically; and conscious and competent in his institutions directed toward socialization, personality development, and mental, even psychosomatic, hygiene. This insistence is by no means as unique to Radin as his book implies; and its thesis is developed with uneven adequacy, varying from lucidity to what may appear as im-

pulsiveness and, in places, murkiness. A few specifications follow:

Aboriginal societies usually were not simple but complex, often extremely complex while at the same time functionally and psychologically integrated. They were organic-democratic, not monolithic-coercive. They conferred on the child, the woman, and the aged, adequate roles. They affirmed, in practice and symbolically, individuality and the inalienable rights of personality. They insured, to all, those "irreducible minima" of food, shelter, and social belonging, which later, more massive, societies have denied to many or to most. Their economic systems, based on giving back more than one received, and on distribution to and through means of the community, were competent systems. These propositions are set forth and are supported factually and on the whole adequately in the book, although with what may appear as insufficient acknowledgment that they have been made and supported many times heretofore by scholars from Prince Kropotkin to Karl Polanyi. And Radin makes a statement which surely is important though not exhaustively accurate: that the real judges of the accuracy of anthropological interpretations are the peoples being specifically interpreted, rather than the social scientists of often conflicting and ephemeral schools.

In Radin's book, the more labored and, by intention, more important, portion is its psycho-cultural interpretation; and space, here, forbids a critique of this. In sum, Radin insists that man always has—since the dawn of the world—confronted those agonies and achieved those triumphs, of individuation, socialization, and discrimination between the inner and outer worlds, which many thinkers have assumed to be agonies and achievements of rather recent epochs. He furnishes evidence, as from myths and "personal documents." He seeks to push back the psycho-cultural horizon very far into human time. He is not first in this effort, nor alone, and his thought appears as uneven, his literary exposition not firmly knit, and his humility and respect for fellow-workers not impressive. The thesis, not his alone, is fundamentally important toward the under-

standing, inadequately attained as yet, of man and world as functions of each other.

JOHN COLLIER

City College of New York

LEWIS, ROY, and ANGUS MAUDE. *Professional People*. Pp. vii, 284. New York: British Book Centre (distributors for Phoenix House, London), 1953. \$4.00.

The publication of *The English Middle Classes* several years ago established Lewis and Maude as sprightly social historians and keen observers of the contemporary British scene. The present volume represents an extension of their concern for the destiny of middle class people and culture under the English welfare state, focusing on those occupations which are broadly known as the professions. On one level the reader will find uncontroversial information about the historical development of English medicine, the law, engineering, education, and so forth, the rise and proliferation of professional associations, present methods of entering the professions, and prospects of remuneration. On a deeper level, these facts are set against the authors' interpretation of the cumulative impact of increasing specialization, the growth of big business, and, most saliently, the rise of the collectivist state.

The dominant theme of the book is that the welfare state, while it has increased the quantitative employment of professional people, has undermined their economic rewards, lowered their social status, and diluted the quality of their educational preparation and their work. The evidence presented on all but the very last of these points is not unpersuasive, although whether all these results will be considered entirely undesirable will depend on one's value-judgments and a consideration of developments in other sectors of English society. There is little mystery about the authors' viewpoint. It is clear from their cumulative work that they regard the upper-middle class English way of life as *summum bonum*, and while they are quite prepared to see orderly recruitment to it from lower orders (they are by no means unreconstructed Tories), they frankly oppose any fundamental threat to its status, culture, and economic advantage. Their de-

fense of this position is a sophisticated one—a neat blend of the old-school-tie attitude and selected social research.

Their most cogent warning, for this reviewer, concerns the dangers inherent in a situation where the state is the sole employer in a particular profession and there are no alternatives in the pursuit of one's career. Only doctrinaire collectivists will fail to be impressed. On the other hand, one might well wish that the authors had devoted some attention to the comparative opportunities for native ability to rise to its natural level of achievement in the old order and the new. This would have added a great deal to the palatability of their concern for upper-middle aristocracy.

MILTON M. GORDON.

Haverford College

MACE, DAVID R. *Hebrew Marriage*. Pp. xvi, 271. New York: Philosophical Library, 1953. \$6.00.

This useful book is essentially a critique of the McLennan brand of evolutionary theory as applied to the early Hebrew family system portrayed in the Old Testament. After defining his terms in the light of modern anthropology, Dr. Mace states the four assumptions of the older evolutionary theory. These assumptions were (1) a simple unfolding of Hebrew culture, (2) totemism among the early Semites, (3) a system of "mother right" preceding the patriarchal regime, and (4) polyandry among the early Semites.

In four successive chapters these assumptions are demolished or reinterpreted. Cultural syncretism is revealed, the patriarchal system rather than totemism is regarded as basic, and a stage of matriarchy is rejected, at least as to significance. While widespread polyandry is denied, the levirate is regarded as a custom which was cherished as a means of providing continuity to the Hebrew patriarchal system.

In the second part of the book it is argued that while polygyny was freely practiced by prominent men, monogyny was the more general practice. For the common man infertility justified the taking of a second wife, although the monogamic

ideal later flourished with changing conditions.

The analysis of mating regulations suggests a cycle of change as to social endogamy and emergence of exogamy with respect to affinity. Secularly arranged marriages with exchange of gifts and transfer of masculine authority seem to have been the rule.

With respect to the status of woman, Mace makes a distinction between the wife and concubine and stresses the special father-child relationship with respect to legitimacy and parental authority. A double standard of sex conduct flourished. Attitudes toward sex expression were colored, however, by religious attitudes toward the practices of heathen cults. Mace agrees with most authorities concerning the early male divorce privilege which was later curtailed.

The charge of beating dead horses might be made against the book. Yet in the course of such beating, the reader is offered a clear, useful, and admirably arranged account of a patriarchal way of life which still exerts influence upon the present day world.

CLIFFORD KIRKPATRICK

Indiana University

RUMNEY, JAY, and JOSEPH P. MURPHY. *Probation and Social Adjustment*. Pp. xvii, 285. New Brunswick, N. J.: Rutgers University Press, 1952. \$4.50.

This welcome volume is an expression of the healthy striving within the field of probation to achieve full professional status. It may be expected that "accountability" for consequences will become a central concern as probation tends, increasingly, to represent a systematically taught and conceptualized means of contributing to the adjustment of offenders through the application, to their particular circumstances, of what is known of the art and science of helping. The measurement with public announcement of the results of one's activities is, of course, an excellent form of reporting and accounting.

While Rumney, Murphy, and the Davella Mills Foundation which backed them are to be congratulated for a responsible undertaking, a reviewer must add that their

endeavor is helpful and suggestive but not successful. It provides leads and warns future researchers of difficulties, but does not achieve its purpose of measuring the results of probation with 1,000 persons as of a date eleven years after court disposition.

To be commended, in addition to the decision to make the study, are the interdisciplinary approach to the choice of criteria and instruments, the painstaking follow-up and review of records, and the careful pursuit of all possible leads in the data analysis. These are not enough, however, to compensate for methodological and procedural deficiencies too numerous for full listing in a brief review.

The basic premise is correct: for lack of appropriate "control" groups, adjustment must be measured against community norms. However, if, as the authors warn, it was necessary to place two-thirds of the study population on probation without presentence investigation, this is hardly an appropriate group for use in research seeking to appraise a method which specifies investigations. Second, adjustment ratings were made on the basis of obviously inadequate data and in terms of very questionable criteria. Several systems of classification were developed for purposes of analysis but prove to be confused and not mutually exclusive. Moreover, the probation service being examined consisted of many different things—or nothing at all—done to or for probationers as varied as truants, husbands in support courts, and hardened criminals. Elaborate statistical processing does not overcome problems such as these. Quite properly, the authors turn from rather forced minor findings to sound discussion of what a court needs for developing sound services.

ALFRED J. KAHN

New York School of Social Work

GOLDHAMER, HERBERT, and ANDREW MARSHALL. *Psychosis and Civilization: Two Studies in the Frequency of Mental Disease*. Pp. 126. Glencoe, Ill.: The Free Press, 1953. \$4.00.

With the widespread current emphasis upon the mental health of the nation and its implications for literally every aspect

of contemporary life, analyses of the frequency of mental illness have particular significance. The most recent consideration of the problem of the incidence of mental illness, *Psychosis and Civilization*, by Herbert Goldhamer and Andrew Marshall consists of two studies. The first, and more extensive, is entitled "A Century of Mental Hospital Admission Rates in Massachusetts," and the second, "The Conditional Expectancy of Mental Disease."

The data for analysis in the first study consisted of first admissions to hospitals for the insane in Massachusetts beginning with 1840 and total admission rates for Oneida County, New York, 1843-65, together with comparable data on a wider basis. By careful and imaginative handling of the data the authors develop their analysis based on the hypothesis that there has been no increase in the frequency of psychoses during the past hundred years. Using the age distribution of first admissions rather than total admissions, the authors find no increase during the last century in the incidence of psychoses among persons under the age of 20 or in the population 20 to 50 years of age. On the other hand, they find a marked increase in the age-specific admission rate in the age group over 50 years which they ascribe primarily to the increased tendency of hospitalizing persons with the mental diseases of old age. They also suggest the possibility of some actual increase in the incidence of these disorders. They properly point out the limitations of their conclusions due to the fact that they exclude consideration of neuroses and psychoneuroses and changes in the incidence of psychoses with an organic basis.

In the second paper the authors examine in greater detail the frequency of major mental illnesses and develop an expectancy measure for the risk of such illness during the life span of an individual or at a specified age. Computations are based upon data for New York State. Estimates are also made of the frequency of psychoses that are not hospitalized.

The findings of the two studies should be of especial use to administrators faced with the problem of determining need for

hospital facilities. A summary of the concrete findings, eliminating much of the technical methodology, would be helpful for practical purposes. For the technically trained reader, the methodology merits careful study. The references to the more important earlier studies of the incidence of mental illness are useful in evaluating the contribution of these two papers.

ELLEN WINSTON

State Board of Public Affairs
Raleigh, North Carolina

SHERIF, MUZAFER, and CAROLYN W. SHERIF. *Groups in Harmony and Tension: An Integration of Studies on Intergroup Relations.* Pp. xii, 316. New York: Harper & Brothers, 1953. \$3 50

Groups in Harmony and Tension is both a summary of various approaches to the study of groups and a report of a specific research illustrative of the author's preferences in method. In summarizing the various approaches to this field, the authors, while overcritical of anything which suggests psychoanalysis, do an excellent job of showing how the behavior of groups, or of leaders within the group, must be viewed in interactional terms. That is to say, both the characteristics of individuals and the standards and norms of the group must be analyzed before an understanding and a prediction of group behavior may be derived. By showing the inadequacies of methods and theories which rely primarily upon any single approach, the authors demonstrate their contention that an essentially interdisciplinary approach to the study of groups is desirable.

Throughout the book, the authors blend statement of preference with theory and with fact, quoting liberally from many other authors and studies to show how previous work relates to their theories. In two chapters toward the end, the authors report two experiments conducted to relate the various hypotheses upon intergroup relations which they developed in the discussion in earlier chapters.

The importance of the topic discussed by the authors can hardly be questioned, either in its theoretical aspects or in its practical implications for complex social living. In

their analysis of these topics, they discuss various factors previously utilized in studies of groups and intergroup relations: deep-seated instincts, the inherent characteristics of race, national character, individual frustrations, special characteristics of leaders. While remaining essentially critical of all these approaches, they concede they all do have a place in a total analysis of intergroup problems. They insist, however, and probably not without good reason, that the essential feature of intergroup relations requires that consideration be given to all these and other factors within the setting of the particular case of intergroup relations being studied. Intergroup relations, they observe, is the outcome of an interaction of forces; some internal—needs, motives, attitudes—and some external—situational, organizational, socioeconomic. A point of special interest made by the authors is that the study of the factors operative within a given group may not be identical with the factors determining the behavior between two or more in-groups. This relationship has properties determined in the course of interaction, features which are not discernible from the study of any single group.

While implications for social action are inherent in the discussion, they are only infrequently made explicit. This volume will be of interest to a person with some knowledge and experience in the field of social psychology and with an interest in the development of theory in that field.

WILLIAM E. HENRY

University of Chicago

BREESE, GERALD, and DOROTHY E. WHITEMAN (Eds.). *An Approach to Urban Planning.* Pp. xi, 147. Princeton: Princeton University Press, 1953. \$2 00.

This short anthology, derived from a conference, by its title suggests a coherent approach to the planning of cities. This is not the case. Rather, these are five approaches to different phases of urban planning by five nimble minds. These five essays are prefaced and epilogued by a pair of succinct declarative commentaries on the state of urban planning by the editors. Hugh R. Pomeroy in the initial essay on the planning process, among other

things, cautions against commitments in current planning that would irrevocably bind communities to future decisions. It is a plea for flexibility and also humility. It is a paper that ranges over a tremendous number of problems and within a very brief amount of space makes useful comments on those problems. The subject range includes the early history of the city planning "movement" in this country, the nature of the so-called master plan, and the various forms in which citizen participation in city planning may take place.

The succeeding papers are of a different, somewhat more specific, nature. Thus the second paper, on land use and zoning, by Norman Williams, Jr, tends to note the main devices and practices in the controlling of land for residential, industrial, commercial, and other uses. Similarly, the essay on housing and urban redevelopment by Charles K. Agle and the paper on metropolitan transportation by C. McKim Norton attempt to cover the main problems that have been faced in practice.

The land use and zoning essay starts with an abbreviated statement on commonly accepted goals and the legal instruments for controlling land use. The stress of the paper is on zoning devices such as minimum building size and garden factory districts. The housing and redevelopment essay in a "homey" style emphasizes the different housing requirements of the family in various stages of its life cycle. Problems mentioned include the deficiencies of housing standards, congestion and the lag between technology and consumed desires. Both possibilities and limitations of a publicly aided urban redevelopment program are indicated. The transport essay treats circulation not as an independent variable but as part of the community fabric. There are comments on metropolitan organization, parking, and transportation.

The concluding essay, by Walter H. Blucher on fiscal programming, returns to the critical over-all vein of the opening essay of Pomeroy. It briefly dissects the rule of thumb decisions that have been made in allocating funds for public development proposals, and it stresses analysis of a social and economic way of life as a basis for capital programming and for the

comprehensive planning to which such programming to be rational must be allied. The questions raised in this paper make me wish there had been more room in the volume to help develop the "basic principles and perspectives" mentioned in the preface.

Like most anthologies, this one does not present a consistent image of the subject. What it does do is to provide a set of stimulating essays (and an annotated bibliography) of interest and use to local government officials, to students and others involved in community planning, and to interested laymen.

MARTIN A. D. MEYERSON

University of Pennsylvania

FISHER, LLOYD H. *The Harvest Labor Market in California*. Pp. xi, 183. Cambridge, Mass.: Harvard University Press, 1953. \$4.50.

This is the most recent of the studies sponsored by the Jacob Wertheim Research Fellowship. It is an outstanding contribution to our understanding and knowledge of the casual farm labor market. The plight of the migratory agricultural worker has long been the subject of study by many agencies and groups which have proposed programs for improving his life. The recommendations made by these studies show a wide area of agreement on the necessary reforms. But as Professor Fisher points out, the record of accomplishment is very scanty. After reviewing the record with respect to the persistent exclusion of agricultural workers from the protection of the major labor legislation of the Roosevelt Administration, he comes to the conclusion that "the power of government is not available for every task which logic or ethics may set for it." The brightest hope for the solution of this problem of the seasonal agricultural worker, he believes, lies with the elimination of the jobs upon which they depend, largely as a result of farm mechanization and of the transfer of workers from agricultural to industrial labor markets.

In an exceedingly able and interesting exposition, Professor Fisher points out in Chapter I that the California agricultural labor market is "structureless" with no sys-

tem of job rights or preferences, no personal relationship between employer and employee involving informal obligations and various types of moral tenure. The work is largely unskilled, the method of compensation by unit of product, and, finally, the operations require very little capital or machinery. Such a market has many advantages to the employer. He can employ any kind of labor. In fact, the market for harvest labor is organized to maintain the advantages of disorganization. Prejudice and labor union restrictions play an important part in immobilizing the farm worker.

Succeeding chapters of the book discuss the history and functions of contract labor in California and wage fixing by employers associations and by the government.

Administrators of the United States Employment Service will be particularly interested in Fisher's discussion of the relatively minor role played by this Agency in organizing the agricultural labor market in California as contrasted with the position of the labor contractor.

The foreword of the book states that Professor Fisher died at the age of 41, just a few days before his book was to be published. His untimely death will be regretted greatly by all who read this book. Surely he richly deserves the encomium paid him by Clark Kerr and John T. Dunlap in the foreword.

E. J. EBERLING

Vanderbilt University

KOGAN, LEONARD S., J. McVICKER HUNT, and PHYLLIS BARTELME. *A Follow-up Study of the Results of Social Casework*. Pp. 115. New York: Family Service Association, 1953. \$2.50.

The latest publication of the extended program of research in social casework of the Institute of Welfare Research of the Community Service Society of New York, this study presents an attempt to discover whether there is any carry-over from a client's experience with a social agency, in his future living. Designing a form of follow-up method, the researchers used a group of 38 cases which had been assessed by the Institute's "Movement Scale" while

they were being helped by the agency and which had then had no contact with the agency for five years. The determination of the predictive validity of the earlier judgment was a secondary goal of this study. The data on which the study bases its conclusions are derived from interviews held by one interviewer in unannounced direct contact with 80 individuals in these 38 cases. Discussing their previous and present experience with surprising willingness with this stranger, these former clients produced convincing evidence that they had held on to their gains and had in reasonable measure improved their status. Though the researchers found no significant relation between the amount and direction of change experienced while being helped and the amount and direction of development during the five-year interval, they concluded that there was an indubitable, beneficent result from the casework experience, still operative in the lives of these former clients.

The clients' expressed feelings about their experience with the agency were on the whole most positive. Even individuals who had been judged by the "scale" to have had little or no development, considered themselves in retrospect to have been helped. The predictive validity of the original judgment of movement was questionable on this score as well as on others. Submitting the old records to new predictive study by a team of skilled caseworkers yielded more positive correlation, thus indicating that case records contain a yet untapped resource for study, best understood by skilled caseworkers.

Presented as an exploratory study in the use of the follow-up approach, it is creative in its attempt to quantify intangibles. It courageously uses assumptions and draws inferences, and has a healthy respect for empirical results. However, the quantification of the results of these 38 cases for the purposes of measurement ignores all the great differences of problem presented in them and of time and money spent on them by the agency, and thus reduces the help given to a common denominator which to this reader seems meaningless. We have yet to discover what *process* was really being evaluated as to its worth to society.

The results of this study, tentative as they are, nevertheless give "the assurance of firm fact" which substantiates the community's belief in the social agency as an instrument of social betterment. Thus it encourages social workers who could not operate without that belief to continue to collaborate in the search for facts which may reveal new connections between their faith and the acts which they perform.

ROSA WESSEL

University of Pennsylvania
School of Social Work

GOLDMARK, JOSEPHINE. *Impatient Crusader: Florence Kelley's Life Story*. Pp. xiii, 217. Urbana: University of Illinois Press, 1953. \$3.50.

For those of us who knew Florence Kelley and the dedication of her life, it is good to have her story spread out before us and to see from the distance of the years that have passed since her death the pattern and design of her accomplishment.

Reading *Impatient Crusader* I am impressed with the fact that Mrs. Kelley was more interested in preventing the disease than in nursing the afflicted; she preferred safeguarding the worker to giving charity to his widow. She believed in using the tools of intelligence and research for the facts, and in bringing about cures by improving the laws of the land. Her *veni, vidi, vici* was "investigate, educate, legislate." Her ability to plan and organize her campaigns for her objectives was extraordinary; the passion of her sincerity without any hysteria was, of course, convincing and invincible.

And what a group of women developed and grew into real servants of their country within the old brick walls of Hull House: Jane Addams, Julia Lathrop, Alice Hamilton, Florence Kelley! And what allies Mrs. Kelley had when she came to New York to take up her work in the Consumers League: Lillian Wald and Paul Kellogg!

There is always a danger, when looking back, to feel that the big souls who carved out the wilderness were made of firmer and better stuff than are the crusaders of today. Miss Goldmark's beautifully told re-

view of Florence Kelley's life is an antidote for such stultifying thoughts; it is a challenge and a quickening for anyone who looks about him and sees he has a job to do as a citizen.

It is especially fitting for this simple story of a wonderful woman to have been told by her close friend and associate, Josephine Goldmark, but as we read of the long struggle for legislation concerning wages and hours, employment of children, and protection for mothers and infants, we cannot be content to call Mrs. Kelley "impatient." Her impatience was of the sort that kept her constantly working, keeping alive these most important issues; it was the impatience only of the patient, of the sure, the right.

It is appropriate, too, to have the preface and the chapter in retrospect of this fine book written by Elizabeth Brandeis, the daughter of the great man, Chief Justice Brandeis, who did so much to aid in the accomplishment of Mrs. Kelley's purposes, and the foreword done by Chief Justice Frankfurter, another clear-thinking, hard-working friend of Mrs. Kelley and of her causes, which we of today consider as parts of our inheritance.

CHARLOTTE CARR

New York City

PHILOSOPHY AND RELIGION

STUBER, STANLEY I. *Primer on Roman Catholicism for Protestants*. Pp. xii, 276. New York: Association Press, 1953. \$2.50.

It has been said, and with more than a modicum of truthfulness, that "nothing on earth consumes a man more quickly than the passion of resentment." Which could explain why Dr. Stuber, an observant Protestant, alert to the dangers threatening many of his co-believers, besieged as they are with a marked misrepresentation of things Catholic, sought to do something about the avalanche of recent literature that has, in some circles, at least, built up a mountain of Protestant resentment and ill will toward Catholics. What he has

done is to write what must be regarded as an admirably objective and highly irenic manual. For this, Catholics as well as Protestants can be grateful. It can unquestionably help both.

Carefully detailing beliefs and practices in a manner that savors of the Baltimore Catechism, he has set them forth in contrast with what he feels can honestly be stated as "Protestant" convictions. The result is a happy one: a calm and informative book which, while hardly a profound dissection of intercredal differences, is none the less a noble effort to bring about a greater understanding between all Christians.

Minus the long, tiresome harangue so characteristic of the Blanchard books on the subject, this volume is pleasantly different. Its treatment of Catholic beliefs, whose orthodoxy has been carefully substantiated by a competent priest, is a balanced and commendable one—something that cannot be said, however, in regard to all the author's reactions to such beliefs. Frequently, he can be found jumping to conclusions. And nowhere is this more evident than in the recognition of his not-too-disguised thesis that the Catholic Church is an admirable organization if it restricts its beliefs to its own followers and stays within the confines of the sanctuary.

In this conviction, Dr. Stuber turns up with the expected in his treatment of the usual points of intercredal controversy—birth control, papal infallibility, religious freedom, and divorce. Unfortunately, his conclusions are sometimes open to question. As an instance, he writes: "Roman Catholicism, because of its hierarchy, does not adjust easily to democratic principles and practices."

However, no matter how much one may find it necessary to disagree with Dr. Stuber in his reactions to Catholic beliefs, it must be admitted that he is probably as impartial concerning the Catholic Church as any convinced Protestant can be. His frank admission of suspicion and misgiving about the intentions of the Church indicates, to be sure, his fundamental Protestantism but it also establishes the not-to-be-denied tragic fact that the Catholic

Church has a great job to do in explaining its most elementary principles and practices.

JOHN H. DONNELLY

University of Pennsylvania

DAWSON, JOSEPH MARTIN. *America's Way in Church, State, and Society*. Pp. vii, 189. New York: The Macmillan Company, 1953. \$2.50.

This is the credo of a remarkable person, the closest approximation of Roger Williams produced by the twentieth century. Joseph Martin Dawson, now on the eve of his retirement from the position of executive director of the Joint Baptist Committee on Public Affairs, was for many years a Baptist minister at Waco, Texas, deep in the heart of the Bible Belt and White Supremacy. Yet he stoutly defends secularism (a term that he shows has wrongly become identified with atheism), the United Nations, a liberal immigration policy, freedom of political expression, and racial equality.

A Baptist's espousal of the principle of separation of church and state is not surprising. No group, certainly no religious group, contributed more to the evolution and establishment of this principle in the United States than did the Baptists, and for this America owes them a great debt of gratitude. But the contribution is not a matter merely of the historic past; it is a continuing contribution, and one of especial value today. For recently the principle of separation has been subjected to a steady campaign of attack and criticism whose effect, if not purpose, is to equate separation with secularism and secularism with atheism. A defense of separation by secularists such as Dewey, Kilpatrick, and Kallen fortifies rather than rebuts the equation of separation and atheism; but a passionate defense of separation by a revered spokesman of the most theologically conservative major Protestant denomination in the country cannot be so readily dismissed.

Mr Dawson's book is deeply religious in its tone and argument. Perhaps it claims too great a role for religion in the fashioning of the American democratic so-

ciety. Yet none can deny that the social gospel has had a tremendous influence in American life, and this book recounts briefly the meaning of that gospel to one of its most devoted adherents. The book discusses the Americanization of the Protestant churches and the concomitant secularization of the American government. It discusses and defends that interpretation of the First Amendment's ban on laws respecting an establishment of religion which bars government from any intervention in religious affairs even to the extent of according material benefits to religion on a nonpreferential basis. It takes issue with Protestant no less than Catholic critics of the secularism of our public educational system and quotes Ben Franklin's pungent remark that "When a religion is good . . . it will support itself and when it cannot support itself and God does not care to support it, so that professors are obliged to call for help of the civil power, it is the sign . . . of its being a bad one."

It supports church participation in the struggle to better this life, rather than merely to prepare men for the next. Opposing Marxism, it nevertheless urges a progressive labor policy. It sets forth an approach of reason rather than blinding passion to the problem of divorce; it urges integration of the Negro in American society as a command of Christianity and finds in the charter of the United Nations "an approximation of Christian principles." All in all, this is an interesting book by an interesting personality.

LEO PFEFFER

American Jewish Congress
New York City

FINKELSTEIN, LOUIS (Ed.). *Thirteen Americans: Their Spiritual Autobiographies*. Pp. xii, 296. New York: Harper & Brothers, 1953. \$3.00.

These are essays by thirteen persons who are contributing to the preservation and advancement of civilization, including Negro and white, Christian and Jew; twelve men and one woman. Eleven of the essays were delivered as addresses at The Institute for Religious and Social Studies of the Jewish Theological Seminary of

America, and two were especially written for this book.

It is rarely that the admiring bystander has a chance to look behind the scenes and see the inner motivation of the men and women who are shaping his generation, and the influences which were most potent in shaping their lives. These essays give that opportunity, to almost an embarrassing degree in some cases.

One is struck first of all by how much these men and women have in common, diverse as they are in background and religious faith. There is the early home influence, and in most cases also that of a childhood church and community, to which almost without exception they give the credit for what they have become.

Again, there is the recurrence of tribute to some great teacher or other personality who at some formative time gave sense and direction to a young life seeking a mission or just drifting.

All are persons of action, men and women who are resolved to do something toward the betterment of human persons and society. Their contributions are being made in many different directions, but with a singleness of purpose that transcends personal comfort or gain.

In all cases, social idealism is permeated by a belief in God and a dependence on the power of God for the achievement of ultimate ends. There is no labored theological argument. Each stands in humility and awe before the Creator, confessing his own sense of mystery.

Though representing many faiths, these leaders profess a breadth of religious sympathy and understanding which is able to go far beyond the petty differences which divide men. Of such is truly the Kingdom of Heaven.

The nature of the material in these essays, and the fact that most of them were delivered as addresses, sometimes give the reader the impression of an old man reminiscing about the past. This is in part due also to the reticence with which a humble person will speak about such intimate matters. The impression of the whole, however, is one of having been in communion with persons of real spirituality and humility. One could wish that many

Americans, especially young Americans, might have the inspiration of these examples of religious living at its best.

PAUL H. VIETH

Yale University Divinity School

BUTTERFIELD, HERBERT. *Christianity in European History*. Pp. 63. New York: The Macmillan Company, 1953. \$1.75.

This slender volume contains the 1951 Riddell Memorial Lectures delivered at Durham University by the distinguished British historian whose learning and sagesse have become renowned, and who in these days of renewed interest in the achievement of Lord Acton may be regarded in part as his avatar in our generation. These compact lectures continue the theses developed in such works as *History and Human Relations* and especially *Christianity and History*. The author's previously formulated admonitions against the oversimplification, overdramatization, and lurking distortion of historiography, his emphasis on the power factor inherent in social organization, and his crystallization of a Christian philosophy of history, penetratingly summarized in an earlier composition by the somber judgment that what history does is to "uncover man's universal sin," continue operative in the present book. Clearly, a brief notice is incommensurate with the magnitude of its theme and its erudition and wisdom.

The first lecture, "The Making of Christendom," re-examines the diverse factors in the expansion of Christianity in the Roman Empire and appraises the consequences for the world of the European triumph of a religion oriental in origin but subsequently largely confined to and identified with Europe. In the postclassical world Christianity performed the function of helping to create a new social order out of the chaos of barbarism, thereby producing Europe as an historic entity. This section replete with sociological observations on the origin, diffusion, and functioning of Christianity and, by extension, of other world religions, is terminated by an analysis of what Butterfield terms the "uncanny nature of the parallelism between modern communism and the Christianity of the post-classical period."

In the second essay on Christianity and Western Civilization, we survey the medieval achievement and follow the transformation of the formal religion of the mass-converted barbarians of Europe as Christianization is achieved by missionary endeavor, gospel preaching, pious example, and subtle exertion of influence. In this discourse Butterfield also traces the Great Secularization since the seventeenth century with its manifold effects, among which are an increase in the urbanities of living, the spread of unbelief among the intelligentsia, and the neutralization of the state in regard to religious matters. Like the humanism of the Renaissance not a few of the humanitarian manifestations of the Age of Reason were by-products of Christianity and persisted as hangovers from the age of faith. Modern humanitarianism, liberalism, and internationalism are interpreted as translations into a secular tongue of aspirations originally of religious provenience, which undergo attenuation and occasionally even inversion as the alienation from religious origins proceeds apace.

The last lecture is concerned with the relationship of religion to ethics and society, and it computes Christianity's achievement in man's eternal struggle for self-transcendence and collective redemption. Like other religions, Christianity as a historical manifestation cannot escape the operation of various forces which have shaped their emergence, expansion, structure, and influence. Butterfield stresses, however, that it has enriched history uniquely by its teaching and exemplification of charity; yet he does not exaggerate its beneficent influence on mundane affairs, nor glose over the unChristian record of many of its practitioners. An iridescent *mystique* shimmers through the closing pages where the author evaluates the potential contribution of New Testament Love to the tranquilization and rectification of today's alarmed world.

EPHRAIM FISCHOFF

American International College
Springfield, Massachusetts

RICH, EDWARD CHARLES. *Spiritual Authority in the Church of England: An*

Enquiry. Pp. xxiv, 218. New York: Longmans, Green and Company, 1953. \$4.50.

This book is an attempt to examine the question of authority in Christianity, particularly as it affects the Church of England, of which the author, Canon Rich, is a distinguished clergyman.

Dr. Rich begins by describing the break-away of the Anglican Church from the papal allegiance in the sixteenth century, and the "appeal to sound learning" by which, in the hands of its great apologists, Jewel, Hooker, and Andrewes, it sought to justify and defend its position. Then he considers the several other kinds of authority which have subsequently been put forward in England—the Puritan reliance on Scripture alone, the rationalism of the Arminians and even more of the Deists, and the appeal to experience which found ultimate expression in the Quaker doctrine of the "Inner Light." This historical section closes with an account of John Henry Newman's attempt, in his *Lectures on the Prophetic Office of the Church* (1837), to think out afresh the relation of the Church of England to Roman Catholicism.

In the second section of his book Canon Rich seeks to work out a constructive solution of this problem of religious authority. He rejects the extreme biblicism of the Puritans and the rationalism of the Deists as well as the "Inner Light." While acknowledging that ultimately Christian doctrine must come home to the individual in his personal experience and freely authenticate itself to him, he contends that the final authority must be the Scriptures and tradition. These two, however, are not to be regarded as mutually disparate, but rather as constituting an inseparable unity, both being produced by that revealing act of God which culminated in Jesus Christ, and tradition merely making explicit what is implicit in Scripture. To the question of who has the right to decide as to which elements in the tradition are congruous with Scripture and therefore authoritative, Dr. Rich answers that it is the Church which has been entrusted with this responsibility.

It is at this point, however, that some

will find Dr. Rich's book least satisfactory. For outside the Roman Church, which regards the Pope as infallible when he speaks *ex cathedra* on questions of faith and morals, there is no group or body which is regarded as having the right to decide authoritatively on questions of Christian doctrine.

The value of Dr. Rich's book lies not so much in its conclusion as in the fact that it raises a question of great importance for all Christians, and discusses this question with learning and in a spirit of sweet reasonableness.

NORMAN VICTOR HOPE

Princeton Theological Seminary

LEE, MAURICE, JR. *James Stewart, Earl of Moray: A Political Study of the Reformation in Scotland*. Pp. xi, 320. New York: Columbia University Press, 1953. \$4.00.

Histories of the Reformation convey the impression that John Knox was not simply *magna pars*; he was in fact just everything in the Scottish Reformation, an impression which is not contradicted by Knox's own history of the events. One comes away with the uneasy feeling that the role of one man may have been exaggerated. This book redresses the imbalance.

The Reformation in Scotland would never have succeeded without the aid of the nobility. Among them none was more significant than James Stewart, Earl of Moray, the half-brother of Mary Queen of Scots. He was at once a convinced Protestant and an astute diplomat, and in addition was strategically situated in a turbulent time to steer Scotland toward two momentous objectives, the establishment of the Protestant religion and an alliance with England. The Earl paid for his tenacity with his life. Under James VI of Scotland (and James I of England) he was vindicated, and thereby Protestantism was quite probably also saved for England and the continent, for had Scotland remained Catholic and in league with France, England might well have been unable to maintain the breach with Rome, and had England failed, the Low Countries might also have succumbed. The achievement of Lord James was great. Here he receives his due

in a careful, well-documented and readable account

ROLAND H. BAINTON

Yale Divinity School

MUELDER, WALTER GEORGE. *Religion and Economic Responsibility*. Pp. xvii, 264. New York. Charles Scribner's Sons, 1953. \$3 50.

The concept of economic responsibility is a sign of immeasurable progress. A reign of physiocratic theory with its fiction of impersonal process is not easily overthrown. Echoes are still heard of Ricardian assumptions about a horde of unorganized individuals, shackled by egocentrism and motivated solely by self-preservation or self-interest. Respectable superstitions die hard. The demise of those twin monstrosities of abstract thinking, the economic man and the law of supply and demand, would call for a celebration. Every year their progeny multiply physical and mental disorders among "tired" business men, and in reaction some college graduates are beginning to resent a policy of "making a fast dollar" off your neighbor.

Dean Muelder's theme therefore brings the foresight of an ethical setting for vital economic and political values. He writes with keen perception and patience with factual material. He has drawn upon a host of supplementary authorities. His bibliography would enrich the library of many an educational institution. He allies himself with voices and movements bent upon humanizing social relationships, dealing plainly with such topics as postwar planning, government by cartels, decaying imperialism, Soviet totalitarianism, and the Point IV program of the United States government.

What about religion in all this? Here and there courageous persons speak out for a higher righteousness, but religious institutions generally have carried the flag of convention. Charity, philanthropy, and stewardship as yet scarcely venture beyond a shrewd meliorism. In this discussion ethical science is first reduced to "social" ethics and then suspended from a theological monism. Accent falls accordingly upon achieving an inclusive common good and elaborating the commutarian na-

ture of personality. These two emphases, together with cognate assumptions, displace what is of prime importance—the vertical dimension of a higher justice. Without that prime concern social and religious theory alike wither at the root.

IRL G. WHITCHURCH

Kingfield, Maine

SABINE, PAUL E. *Atoms, Men and God*. Pp. x, 226. New York: Philosophical Library, 1953. \$3.75.

This is a very good book, and a useful one. It gives a clear thoughtful answer to the question that must trouble a good many who are important in community leadership. The question is this: How can I believe the latest teachings of science and also believe in the Incarnation of Jesus Christ? As Sabine correctly states, most religionists and most scientists keep their science and their religion on opposite sides of watertight doors. This book safely opens the doors.

The author is a physicist, and his history and analysis of the development of scientific thought from the earliest days to Einstein and the waves or particles of light, is a model of clarity and simplicity.

It is fortunate that we have come through the period of the atomistic and mechanistic view of inert matter moved by mechanical and electrical forces, running down toward the fatal climax. That was appropriate for a world of hatred, strife, and greed. Now we have a mathematical world image of vital energy, not running down, but *becoming*, in an infinite rhythm of destruction and creation. In this physical world as described by the observer's mind there is evidence of purpose. The system of heating or cooling the human body to keep an even temperature beats the usual physical laws of loss of energy, and so do the hemoglobin of the blood, and the chlorophyll of the plants. That is what they are there to do, not just by chance. Either this physical world evidences pure thought in the mind of God, or it is not real at all.

Besides the physical world, there is the self that I know, which includes not only all my past individual experiences and the influences of my parents, but a whole un-

broken chain of ancestry. I am like an omnibus carrying innumerable ghosts of all who have gone before me, with their good and evil urges, but also with the psychic drive of their religion, something that seems essential in the evolution of the human spirit. Evolution is part of this process of a boundless vital urge, which expresses itself in adaptive variations and radical mutations. The first life on the planet and the arrival of the conscious mind were surely two of the most radical creations.

In this process of evolution in the human soul, in the days of Caesar Augustus the tribal Jehovah had become one God of justice and mercy for all people. Jove, the human emperor on Olympus, had become the divine Reason of the Logos. And many had conceived the idea of the redemptive sacrifice of a God ending in a mystical union with the believer's soul. The world was disintegrating, and yet looking expectantly for something. In Jesus and the Christianity he began they found their goal. Is there any real stretch of the scientific mind to see from these variations the sudden mutation we call the Incarnation?

The book is commended to every troubled religionist. He will find real spiritual food. It should help the parsons, too.

CHARLES P. TAFT

Cincinnati, Ohio

COLWELL, ERNEST CADMAN, and ERIC LANE
TITUS. *The Gospel of the Spirit*. Pp.
190. New York: Harper & Brothers,
1953. \$2.50.

The volume's title is not provocative, but what it says should invite Christians to repent and make atonement for the traditional misinterpretation of the last week in Jesus' life. What has been the esoteric property of a few professors and students now may become the possession of any who study this volume.

There is general agreement among historians that the Fourth Gospel was composed at Ephesus in the second century but not by one of the Twelve Apostles. The facts collected in this argument compel the conclusion that its author was not

a Jew but a Gentile since he assumed that the high priest's office rotated annually, knew naught of Hebrew parallelism as a poetic form, and had stones available in the Jerusalem temple to throw at the Nazarene.

The purpose of this Gospel was to interpret the significance of Jesus to puzzled mid-second century Greeks and Romans who were calling Christians atheists and accusing them of sacrificing an infant in connection with the evening rites of the Lord's Supper. Hence he composed this philosophical treatise from which he deliberately and purposely omitted over 80 items found in the Synoptic Gospels, adding some 9 more or less new ones, transforming Synoptic materials he retained, reconstructing what he had read in available Pauline materials and perhaps in the Acts by the Spirit through the Apostles, and coming to terms with the Oriental mysticism everybody around him was so excited about.

According to the Fourth Gospel, Jesus was born of Joseph and Mary as a human being. There is no virgin birth and no immaculate conception in "John." But at the baptism, the Spirit descended upon him *and abode on him*. Thus Jesus became incarnate God through the possession of the Spirit to accomplish these divine ends: to die upon the cross and to bestow the Spirit upon his adherents. So the sentence of Jesus to death by Pilate was the execution of a primeval divine decree. The cross was not tragedy but triumph and exaltation. "The trial of Jesus was the trial of a god."

Judas is reconstructed in this Gospel. Jesus chose Judas as one of the Twelve in order that Judas might betray him (John 6: 64). The "disciples do nothing to prevent the betrayal." Jesus himself sends Judas out to betray him (John 13: 27-30). Judas makes no bargain with the enemies of Jesus, nor does he kiss Jesus to point him out.

Jesus is not the trembling man of Gethsemane the Synoptic Gospels describe but takes charge at his arrest. He acts as a god ought to act, and his trial is that of a god. In the Synoptic Gospels, Jesus enters Jerusalem "humble and riding on an ass";

in John "humble" has vanished! The cross is no surprise to Jesus here. He faced it from 1: 29 on.

What now? Since the Fourth Gospel has become symbolism, it must no longer be interpreted as fact and the Church year in its Lenten phase demands revision.

CONRAD HENRY MOEHLMAN
University of Southern California

KIMPEL, BEN. *Faith and Moral Authority*. Pp. 186. New York: Philosophical Library, 1953. \$2.75.

The author of this book is a professor of philosophy at Drew University. He presents a well argued critique of those philosophies which hold that no *general* principles can be known for the dependable direction of life. He maintains that an individual cannot achieve a morally ordered life without some directives which have been learned from others and preserved in an institutional tradition. He does not contend that such principles can be intuited as self-evident but that they can be sifted, formulated and reformulated, justified, or rejected, by the processes of rational criticism. This critical search for adequate principles is an expression of moral faith which, we are told, "is a conviction that an individual has a responsibility to find out what can be known about the ways in which a more abundant life can be secured for himself and for others" (p. 105). This faith is served and guided by "moral insight" which is "a discovery of a way to act which will be beneficial to human life" (p. 109). The defense of this faith and this interpretation of moral insight lies in the argument that they are in practice essential to the moral life of the individual and society.

The author justifies his position chiefly through a comparative discussion of Socrates, Plato, Aristotle, and the Sophists, with some slight reference to contemporary naturalists. There is nothing fresh in this part of his argument. From this, however, he goes on to a discussion of contemporary existentialists, especially Jaspers and Gabriel Marcel. This forms the larger and most interesting part of the book. He argues that the phenomenalism of their

theory of knowledge and the pessimism of their interpretation of the human situation make their philosophies an inadequate basis and guide for the moral faith man needs.

A. CAMPBELL GARNETT
University of Wisconsin

WIDGERY, ALBAN G. *What Is Religion?* Pp. xi, 330. New York: Harper & Brothers, 1953. \$5.00.

Widgery's qualifications amply guarantee a work of outstanding merit. In acknowledgment of how perspective and main results in a study stem from theory of knowing, he makes that subject an early chapter. He adopts a theory of knowing by *acquaintance*. Mystical intuition gives the best example. It enables religion to stand on its own feet.

But can "history of religion" carry that load? What does religion say out of the rather nebulous "religious" assertions, or "religion in general," "the religions," and "religion"? Reference to many religions adds up essentially to multiplication of illustration, with a minimum of critical evaluation of ideas. The fact that many religions, for example, feature the "golden rule" is singularly unimpressive. It tabs an elementary sense of justice. At its worst it falsely glorifies any individualistic idea of justice, and at its best presents only a general admonition to be fair in our dealings. To identify justice with some abstract generalization about it is confusion, while to assume a universal knowledge of its ideal is devilish mischief.

Writers generally have slighted the emotional and practical expressions of religion, Widgery thinks. "History of religions" corrects this false step. Idea-versions also indulge in invidious comparisons. But it is far from clear that such a correction validates a religious intuitionism. Indeed that carries the seed of incalculable damage to the human spirit and to religion itself. When preferences are bathed in emotional fervor and implemented by ritual, it is a sorry day for the spirit of reasonableness. Questions about evidence are overshadowed by concern for abstract "proof," so that solipsism turns out to be

irrefutable. Or, can theism be satisfied with a consolation that "it is not inferior" to alternatives? In a time when actual religions are almost hopelessly enslaved by emotive preferences and customary practices, should reason be confused with some of its children of specialized abstraction or made to stand over against experience? Are assertions about the reality and "existence" of God the peak of religious understanding? Talk about the "existence" of God seems especially barren.

Knowledge in any field, with its beginning in abstract generalization, can move ahead toward concrete comprehension—provided reason's back has not been broken. This is admirably illustrated in later chapters on sin and suffering, significance of religious practices, emotional attitudes, and ideals. On these themes the religious judgments of mankind show remarkable unanimity. To have set out these insights with a spirit as commendable as it is rare, contributes much to religious sanity and development. Those who seek the quintessence of religion at its highest reaches cannot expect one book to do everything.

IRL G. WHITCHURCH

Kingfield, Maine

SEELY, CHARLES S. *Philosophy and the Ideological Conflict*. Pp. 319. New York: Philosophical Library, 1953. \$5.00.

This book undoubtedly belongs among the *curiosa* of sociophilosophical literature. It reminds one of Fourier's *Les Quatres Mouvements* in the manner in which phantasy, fact, misinformation, sheer mystical vision, and sharp insights are combined, but, unfortunately, it lacks the high imagination, poetry, and prophetic power of the earlier work. It is written in a matter-of-fact, almost childish naive style, as if everything said in it is unquestionable truth and so obvious that no evidence is required in substantiation.

The author's intellectual temerity is colossal; he covers the whole history of the social rôle of idealism and materialism from the beginning of human history, assigning to both specific and, in general, antithetical rôles in the struggle of man to establish an ideal society. To idealism,

he assigns the social rôle, in general, of keeping man in darkness, superstition, and subjection; to materialism, the social rôle of leading man out of darkness, superstition, and social subjection. Idealists, in general, are totalitarians, haters of the people, defenders of supernaturalism, opponents of science, and perpetrators of ignorance and superstition. In short, they are a bad lot. Materialists, in general, are humanitarian, democratic, idealistic, lovers of knowledge, adamant enemies of ignorance and superstition everywhere. In spite of this rather severe condemnation of idealism and high praise of materialism, he nevertheless insists that idealism and materialism as philosophies have nothing to do with ethics or morality; they are simply metaphysics—that is, conceptions of the origin and nature of the universe.

The author's knowledge of philosophy is obviously gained at second hand; and he shows no compunction about interpreting a philosopher to suit his own convenience. Thus he describes Heraclitus as a scientist of the modern stamp, although it is well known that the "obscure" philosopher attacked empirical science as an obstruction to true knowledge. Skepticism, which modern investigators have shown is the precursor of modern conceptions of scientific methodology, is described as a "philosophy of decline," a rationalization of the defeat of the Greeks.

His ignorance of modern philosophy is incredible. John Dewey, for example, is described as an idealist. The author knows nothing of modern empirical philosophy; and his interpretation of "modern materialism," which he identifies with Marxism and socialism, is one built out of an exotic amalgam of wish-fulfillment, misinformation, and sheer imagination.

While this book is full of incredible generalizations, the sheer products of dreams, it is not wholly this. The author is frankly a socialist and firmly believes that the future belongs to socialism. The evidence he affords is impressive.

The author's most interesting insight is that philosophy is today the basic instrument in the struggle between the old and the new order. The masses must become philosophers in order to decide which so-

cial order will best serve them—the socialist or the nonsocialist.

RUBIN GOTESKY

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MONNEROT, JULES. *Sociology and Psychology of Communism*. Translated from the French by Jane Degras and Richard Rees. Pp. 339. Boston: The Beacon Press, 1953. \$6.00.

Those who attempt to understand Communism as a political movement, and the Soviet Union as a social system and a national state, by approaching these phenomena through a study of Marxist-Leninist ideology are faced by a persistent difficulty. Fairly consistently, on the level of explicit meaning there seems to be remarkably little congruence between the ideology and social reality. Much of the difficulty, of course, stems from the fact that Western scholars display an understandable propensity to treat Marxism-Leninism predominantly at the level of the exoteric ideology and to deal only with manifest content, neglecting the esoteric ideology and the implicit, latent meanings of the exoteric ideology. Jules Monnerot's extraordinary book goes a long way in bridging this gap in our understanding of the relation between Communist ideology and Communist behavior.

Monnerot's starting point is that Communism may be understood as a secular religion, which anticipates the disintegration of capitalist society and the arrival of a new order on grounds of immanence in history, and which contains an imperative for action in this world to achieve the millennium. The prophet of this religion suffused with technological messianism is Marx, who designated the proletariat as the chosen people and founded a sect of the elect to prepare for the coming of the new day. Lenin stands in the role of the apostle who built the church, which is the Party, organized on the hierarchical principles of an army and stressing orthodox conformity. With the first successful seizure of power in Russia, the movement was transformed into a state characterized by a seigniorial and territorial despotism and by tyranny—"an internal regime imposed by a minority on the majority." As it develops this re-

gime is transformed into a "Super-state" which operates as a twentieth-century variant on medieval Islam, "the union of a religion and people for the purpose of conquest, the chiefs of this people tending to wield power beyond its frontiers-by means of religion."

Ideas of this kind about Communism have recently been widely current, although one should not neglect the fact that this book first appeared in 1949. The distinctive quality of this study, therefore, stems from the great range of available insights brought together, and from the fact that they are presented in a systematic framework. In this respect there is no book in the field known to this reviewer which even approaches Monnerot. Furthermore, the summary given above of Monnerot's central thesis hardly begins to reflect adequately the impressively succinct and penetrating analyses he provides of such diverse phenomena as the Marxist principles for disorganizing society, the psychology of the intellectual's adherence to Communist movements, the nature of crowd behavior and its relation to political movements, and the sociopsychological dynamics of police surveillance and terror.

Despite these impressive achievements, Monnerot can hardly be said to have produced a successful or satisfying book. Except for scattered comments he does not deal with Communism as a system of social organization of the type developed in the Soviet Union. And even at the level which he does treat Soviet society, namely that of the political system, he fails almost completely to deal adequately with the patent contradiction involved in describing the Communist Russian empire as both a "tyranny" and an "Islam" in the sense in which he defines those terms. In addition, the book is painfully repetitious, and terribly diffuse. Indeed, Monnerot has so much difficulty in sticking to his subject, and he goes down so many historical by-paths, that his book might more appropriately have been entitled "Some Reflections on Despotism, Absolutism, Tyranny, and other Forms of Sociopolitical Organization." Regardless of these deficiencies, the richness of its insights, the range of its understanding, and the vigor

of its presentation will make this volume rewarding and stimulating reading. It adds significantly to our understanding of Communism as a political movement and a world power.

ALEX INKELES

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Harvard University

COMMONWEALTH OF NATIONS

BULMER-THOMAS, IVOR. *The Party System in Great Britain*. Pp. vii, 328. New York: The Macmillan Company, 1953. \$5.00.

This is an original, useful and stimulating book. One of the great gaps in descriptive political science in Great Britain is the absence of realistic and scholarly analyses of the party system and the party machines. The material available to the student of American politics is far superior in quality and quantity. Only in recent years has a serious effort been made to redress the balance, and this book is one of the weightiest contributions to that highly desirable end. Its author, it is true, has very special qualifications. He is at once a distinguished academic, a distinguished journalist and an experienced politician, a former M.P. and former minister. It is also not a handicap that he began his political life as a member of the Labour party and passed over to the Conservative party.

Mr. Bulmer-Thomas wisely interprets his subject broadly. We are given discussions not only of party machinery or of the law (such as it is) that affects party campaigns but a realistic account of the role of party in central and local government and in the day-to-day running of the House of Commons. Other political forces affecting the party structure are dealt with. There is a succinct account of the role of the press which gains much from the author's wide experience, but it is written entirely from a London point of view, and it is surely an odd sense of proportion that finds room for the *Morning Advertiser* and none for the *Manchester Guardian*. Even from the point of view of London

circulation "the M.G." is more important. Indeed, the main interest of the *Morning Advertiser* is that its most famous nineteenth century contributors were Marx and Engels. In the section dealing with clubs, something might have been said of the ill-fated "1917" club, and the history of the Bonar Law college has been more checkered than is suggested here. Some other minor criticisms might be made. There is, for example, no "schools question" in the religious sense in Scotland, which is important in a country where religion plays a more active part than in England and where the Catholic population is proportionately greater.

On one more important point I am naturally not in agreement with Mr. Bulmer-Thomas. As one of the faithful remnant of Liberals, I do not accept the view that the party was doomed to its present role. Accident played a great part. It may be a white dwarf now (Mr. Bulmer-Thomas has a natural fondness for astronomical metaphor natural in one of his academic background), but in political as in physical cosmology there are accidents as well as predetermined events. And, if the prospects of a party are to be assessed by its appeal to intelligent youth as is suggested on page 146, Liberal prospects are brighter than the author—or the reviewer—thinks them to be. But this is an excellent book.

D. W. BROGAN

Cambridge University

GORDON, STRATHEARN. *The British Parliament*. Pp. 247. New York: Frederick A. Praeger, 1953. \$4.25.

Although this handbook has appeared previously in Great Britain and in other countries, the fourth edition is the first to be published in the United States. Written for the Hansard Society by the Librarian of the House of Commons, the current edition is in part offered "to all the Americans whose interest is so intensely flattering to our [British] institutions."

Mr. Gordon's purpose is to explain in simple terms how Parliament has developed, what it is, how it works, and how it affects people's lives. This multiple objective is accomplished within 175 pages of text which is well larded with illustra-

tions and tables. The rest of the volume comprises eleven useful appendixes, including a glossary of parliamentary terms, and an index.

The author begins with two chapters on the origins and history of Parliament and the British Constitution. He then covers the functions of Parliament, the members and their duties, work of the Commons and Lords. In another chapter he sets forth criticisms of Parliament and discusses them. He concludes with a few pages on the subject of "Benefits and Responsibilities."

Altogether Mr. Gordon has done a splendid job of synthesizing. In keeping to his objective of simplicity, the author boils down much of his material into generalizations. It is his manner of presentation, however, that lifts this work above the ordinary. Mr. Gordon displays great writing skill which makes his book highly readable. He has a knack of selecting apt examples to clarify or illustrate his points. Extensive use is made of quotations from English statesmen and scholars; these quotes always fit snugly into context and give the reader a sense of depth. Another technique is to raise and answer questions; this variant is a further aid in maintaining the interest of the reader.

Clearly, this work was not designed for the expert on British institutions, yet as an over-all survey of Parliament it has values which even the well-informed will appreciate and find useful. Mr. Gordon has packed his guidebook with worthwhile materials. It is an admirably written introductory survey of the British Parliament.

DAVID G. FARRELLY

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KNAPLUND, PAUL. *James Stephen and the British Colonial System, 1813-1847*. Pp. ix, 315. Madison: University of Wisconsin Press, 1953. \$5.50.

Raised in the evangelical and humanitarian atmosphere of the "Clapham Sect," James Stephen was drawn toward the Colonial Office by his concern with the condition of the slaves in the West Indies. In 1813 he became legal adviser, with the duty of scrutinizing colonial legislation. His

keen and active mind was soon discerning many implications other than the strictly legal in the enactments which he was surveying, and these crept into his reports. His industry, knowledge, and insight were such that his superiors learned to treat his advice with respect, and often to follow it implicitly. He was thus already a power at the Colonial Office when in 1834 he became assistant undersecretary and, in 1836, undersecretary.

As undersecretary it seems fair to say that he, more than any other man, governed the British Empire insofar as it was governed from Westminster. He worked in relative seclusion, for all official action was taken in the name of the Secretary of State. But secretaries of state came and went, and James Stephen remained. Some of his contemporaries recognized his influence, and deemed it invidious. The attacks of Charles Buller upon "Mr. Mothercountry" and "Mr. Oversecretary Stephen" were particularly severe, as well as unjust, for they presented Stephen as an opposer of colonial interests and of colonial self-government. Nothing could have been further from the truth. He indeed sometimes opposed measures and policies emanating from the colonies. Yet wherever a colonial society had emerged sufficiently from the pioneering process to have leisure for political affairs, and where it was not handicapped by the existence of a caste system, Stephen was convinced a decade and more before the coming of responsible government that it should be permitted to work out its own problems and learn from the experience of its own mistakes. On the abstract principle of responsible government he declined to comment, but there can be little doubt how he stood on the issue.

Colonies would have become self-governing, mercantilism would have died, and slaves would have been emancipated even though Stephen had never lived, but it does not detract from the man's greatness that he served the needs of his day. Nor would the outlook of the era have been quite what it was had he played no part in creating it. Operating from a uniquely influential focal position, he was able to expedite and ease inevitable transitions, as

well as to occasion many salutary minor developments which might otherwise never have occurred at all.

To survey the results of decades of work by a laborer as indefatigable as Stephen has demanded labors hardly less indefatigable. Nor was it any mean task to fit the results into the confines of the present modest volume. The author quotes at considerable length from Stephen, and one is happy that he does so, for as a writer Stephen was no unworthy contemporary of Macaulay and commands much the same magnificent style. Both for its scholarship and for its exposition Professor Knaplund's work is to be highly commended. No study in the field of nineteenth-century British imperial history was more needed than this one.

LEONIDAS DODSON

University of Pennsylvania

CRANKSHAW, EDWARD. *The Forsaken Idea: A Study of Viscount Milner*. Pp. ix, 178. New York: Longmans, Green and Co., 1953. \$3.25.

"It will almost certainly be pointed out that this book is biased," Mr. Crankshaw writes in the foreword. That the author should himself make this criticism, however, does not excuse the fault. It may be true that Lord Milner's critics have held the field for half a century, but a biased approach can hardly be expected to restore the balance and give a "true appreciation" of Milner's qualities.

We cannot quarrel with Mr. Crankshaw's purpose, namely, to rescue from the heat of controversy some of the permanent ideas in Milner's writings. But we must maintain against the author's polemic the right not to share his enthusiasm for his hero's central idea.

His argument proceeds thus. Milner believed above all in the survival of Britain and the British race throughout the Empire. All he said was related to this theme. Whether the subject was tariff reform, imperial preference, education, sweated labor, or political parties, the health of the Empire was the touchstone of judgment. Here, Mr. Crankshaw asserts, in place of the disconnected compromises of party policies was a coherent policy, constructive and

unifying; and, if steadfastly pursued, it might have saved the world from two great wars. In discarding the imperial idea for the attempts to organize world peace, first through free trade and then through the League of Nations, "we threw away the substance for the shadow."

It is hardly necessary to point out that this is a somewhat sweeping conclusion, leaving many questions unanswered. In the first place, it ignores the changing power situation, in short, the decline of British predominance. And, quite apart from Britain's ability to organize peace, it assumes that others would have been willing to remain outside and see peace organized in the British manner. Moreover, the Empire itself would not have accepted Milner's views. To say, as Mr. Crankshaw does, that the liberals frittered away all chances of imperial union, assumes that there were, in fact, real chances. The fact is that the support for imperial union, even in Canada, South Africa, and Australia, was negligible. And if we look beyond this central core of the present Commonwealth, the prospects for imperial union will be seen as even less hopeful.

In the South African issue, Crankshaw sees little more than Milner's wisdom and the home government's failure. Apparently, he believes that had his advice been heeded, South Africa would have become a key unit in his design of imperial union. But the author gives no reasons to support the view that what the moderate peace of Vereeniging failed to do, the stronger medicine Milner might have administered, would have succeeded.

The failure of Milner's imperial idea cannot be wholly ascribed to the stupidity of his opponents. It never was within any distance of broad support in the Empire overseas. The Commonwealth is today a reality, and imperial federation is dead, because the one did and the other did not take account of the growing aspirations of dominion and colonial nationhood. Lord Milner undoubtedly was a great statesman. His work has not always received its due; but this book does not achieve its purpose of setting the record straight.

EDWARD LITTLEJOHN

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HAMMOND, J. L., and M. R. D. FOOT. *Gladstone and Liberalism*. Pp. xi, 219. New York: The Macmillan Company, 1953. In the "Teach Yourself History Series," edited by A. L. Rowse. \$2.00

The study of English constitutional and political history in the Victorian age is to a considerable degree the study of the career of William Ewart Gladstone. Consequently, he has been the object of research in monographs and biographies, and the chief figure in many other publications. *Gladstone and Liberalism* is a brief study which combines political history and biography in order to interpret his contribution to liberalism in the last century. This book, which Mr. Foot completed after the death of Dr. Hammond in 1949, is an able, friendly study whose only weakness is its brevity.

Gladstone's political career is chronologically presented, with space only in Chapter Three for a glance at industrial England in the first half of the century. This is a logical approach because of the nature of his career. He entered politics as a Canningite Tory, and the first half of his life represents his transition from Tory to Peelite to leadership of the Liberal Party. The authors assert that he forced himself on the party as its "indispensable leader" by the sheer weight of personal and intellectual superiority, a true statement but one which does not wholly explain its acceptance of him. Most of us would agree that his party leadership was inevitable after he became leader in the House of Commons in 1865.

Gladstone's career after 1865 continued to be one of movement and transition in political and constitutional controversies. As this book illustrates, one cannot discern his final position in either political theory or practical politics in any particular decade or event. He quickly won the confidence of the working classes after 1865, fought almost constant political wars with the "upper orders" whom he admired so much and believed to be an essential part of England's social stability, and finally challenged the constitutional power of the House of Lords in his last speech in Parliament. Yet this great "conservative liberal," as the authors correctly label him, declared

in the House of Commons in February, 1866, that the great pillars of civilized society are "property, authority, and religion."

Readers for whom this series was designed, especially if they are Americans, may miss the important fact that Gladstone's liberalism rested upon his frequently and carefully expounded concept of the "Social State." A. V. Dicey said that he made England a practical as well as a theoretic democracy, but most of Gladstone's program was confidently predicated upon what he believed to be England's "frame of society." Until nearly the end of his career, he advanced democratic proposals with reiterated statements that the newly enfranchised electorate would continue to let the old "governing class" govern. No people can govern itself, he asserted; they can only choose and hold responsible those who by inherited station, education, leisure time, and financial independence can govern. Only in the end did he assert that the upper orders had defaulted on their obligations and forfeited the right to govern exclusively.

It might have been possible to analyze somewhat better the great conflicts in which he explained his political and constitutional principles. Some will disagree with the assertion that his intellect was keen enough to discern and his moral sense strong enough to assert distinctions so fine as to be imperceptible to ordinary men. For example, although Lord Kilbracken could describe him as the strongest anti-socialist he ever knew and his liberalism a negation of socialism, Lord Acton pointed to the "latent socialism" in Gladstone's philosophy and asserted that he was the most illustrative representative and most eminent practical teacher in the world of "academic socialism."

Although one detects that the book is friendly toward its subject, the authors do point out flaws in his leadership and his lack of understanding of social and economic conditions. The book is an accurate, coherent study of one of England's greatest statesmen; hence, it is an important book.

ALVIN H. PROCTOR

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JONES, S. W. *Public Administration in Malaya*. Pp. viii, 229 New York: Royal Institute of International Affairs, 1953. \$3.00.

Students of government will welcome this account of the administrative system of Malaya, which is also a contribution towards an understanding of the requirements for efficient public administration in all the countries of southeastern Asia. Its author was colonial secretary for the British Straits Settlements from 1940 until the Japanese conquest of early 1942 and was an officer of the Malayan civil service for some thirty years.

The region includes the federated and the "unfederated" states of the Malay peninsula, together with Singapore and other neighboring British islands. A number of administrative experiments since the Second World War produced many administrative and constitutional changes, notably the creation in 1948 of the Federation of Malaya. This federation is made up of four federated and four "unfederated" states, together with the "settlements" of Penang and Malacca. Singapore remained a crown colony but lost Labuan to the new crown colony of North Borneo to which it is adjacent. Brunei retained its status of a protected state but passed under the administration of the new crown colony of Sarawak.

Public administration in Malaya is the product of British rule and influence. The author in wide sweeps summarizes its administrative history and problems, including its transfer from the East India Company to the Colonial Office in 1867 and the gradual entry of the British government thereafter into the administration of the native states. Administrative programs furthered local development in such fields as health, education, agriculture, forestry, and mining.

Inevitably, many political problems emerged—local, British, and foreign in nature. There was a decided weakness in the first Malayan federated administration, headed up by a combined governor and high commissioner, for the first federation failed to provide adequate central machinery for the shaping of policy. The Federation of Malaya is now governed by

executive and legislative councils, the high commissioner serving as President.

Economically, foreign buyers of Malaya's rubber and other products included Americans and non-British Europeans. Taxation had always been light. Britain sought through preferential tariffs to attract more trade with itself. But Malaya liked free trade. The Japanese vied with Europeans for economic profits in Malaya in the 1930's, doubtless accentuating Anglo-Japanese rivalry elsewhere. Masses of Chinese laborers poured in each year, as exports and prosperity increased. Yet for many of the upwards of five million inhabitants the oppression of hardship and poverty persisted. Many of the Malays and Indians were in a chronic state of indebtedness, in contrast with the prosperous Chinese element.

Recovery, reconstruction, and reform have been under way, economically and politically, since the British reconquest of Malaya in 1945. Rehabilitation has stressed an active medical department, the extension of education, social welfare programs, better housing projects, and the curbing of crime.

VERNON J. PURYEAR

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MUKERJI, KRISHNA PRASANNA. *The State*. Pp. xxiv, 382. Madras: Theosophical Publishing House, 1952.

Western students of government and political theory will be interested in and will profit from a study of this work by an Indian professor of politics at the University of Bombay as it gives a valuable insight into the character and direction of political thought in a newly created State which has increasingly become an important factor in Asian and even in world affairs. This volume gives important clues on the trend of sociopolitical thought in India; it illustrates the traditional intuitive-philosophical approach of Hindu thought; and it quite expectedly concludes with a justification of Hinduism in general and of classical Hindu political institutions in particular.

Pervading this work is the belief that the State is an agent of a moral society estab-

lished for a moral purpose. The State "is wedded to the realization of a moral purpose, viz., to the making of justice available to all on equal terms" (p. 22), and political science must be "the science of justice or dharma." The author finds his inspiration of what the State should be mainly in the classical religious and political treatises of Hinduism with their "transcendental view of reality," their "moral view of the State," and their "philosophy of spiritual reality." Western political thinkers would certainly agree that the State should coincide with freedom, justice, growth, and the best elements in natural law; but an inductive study of states of the past and even of the present would, in their view, show no essential connection between the State and morality. This is unfortunate but it is the lesson of history.

Professor Mukerji is very critical of the sovereign-nation society of the West and in fact of the entire pattern of culture composed, as he sees it, of industrialism, capitalism, imperialism, and nationalism. He refers to this pattern as the Nici-ethos order of things which, it is claimed, came to its real end in 1914. As the logical successor the author calls for the Soco-ethos of socialism and the co-operativeness of a real world order. "Our social ideal can be pursued morally only by democratic socialism and through the instrumentality of a world-State" (p. 286). Perhaps the two most interesting chapters in this book are those that present the author's defense of the welfare or socialistic state and his analysis of the failure of world government in the case of the League of Nations.

In Appendix I there is an eloquent defense of the Hindu Way of Life in which the caste system, at least in its classical form, is defended; and in Appendix II the Hindu view of the State is examined. The author maintains that the State in India always had a constitutional, even a democratic basis and has no sympathy for those who have associated Indian government with capricious tyrants. Again there is the claim that the essential philosophy of the welfare state goes back to the sacred Hindu laws of Manu. The majority of political thinkers, it seems to the reviewer, would

agree that a world order of some sort is becoming more urgent. Urgency, however, has little to do with the capacity and zeal of man to fashion this complex structure; and, further, urgency does not miraculously remove the many obstacles that must be removed before a real parliament of man is created. And in answer to the author's contention that the western state system was uniquely designed to bring about wars, it can be said: (1) that Hindu theories of the State did not reduce war or alleviate anarchy in ancient or medieval times—nor did they deter Indian imperialistic expansion in southeast Asia; (2) that the only reason why India has not engaged in power politics in modern times is because she was a dependency of Britain; (3) but now she has again become independent India in her conduct and objectives of foreign policy is acting no differently than do the other States in preserving what they deem to be their vital national interests.

T. WALTER WALLBANK

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KNOWLES, K. G. J. C. *Strikes—A Study in Industrial Conflict: With Special Reference to British Experience Between 1911 and 1947*. Pp. xiv, 330. New York: Philosophical Library, 1952. \$8.75.

During recent years, the emphasis on the mutuality of interest between labor, management, and the general public may have led to the development of a serious blind spot among certain observers of industrial relations. Perhaps we need such a study as this to remind us that behind every collective bargaining session is the threat of a work stoppage.

In presenting this analysis of strikes and the possibility of strikes, the author points out that while such studies have been made in the United States, no systematic treatment of work stoppages, their causes, their nature, their consequences, and what is being done about them has been attempted for Great Britain.

This work is primarily statistical. Full use is made of available statistics on work stoppages and a number of worthwhile suggestions are offered for improving the Eng-

lish statistical series. The author ventured far afield from pure statistics, however, ranging into economic history, political science, economics, and even social philosophy and psychology, to present a *tour de force* of labor-management relations in Great Britain. Statistical and descriptive demonstrations are presented of the effects of unemployment, relatively full employment, alterations in union policies and objectives, the growth of union responsibility through participation in government, the growth of employer organization, and the changed role of government, both as an arbitrator of disputes and as an employer of labor.

While the attention of the author is centered on the period 1911-1947, material is presented bearing on strikes and attitudes toward them back to 1867; thus the discussion tends to range back and forth over extended periods, during which the attitudes of the participants have changed quite drastically. The author does not, however, seem to make allowance for these changing attitudes—as though, for example, pre-World War I syndicalist theories may still have validity in the thinking of union leaders.

While an intimate knowledge is displayed of events and developments in England, no such detailed and up-to-date grasp is demonstrated in frequent allusions to things American. We are told, for instance, of cities, counties, and even states in the United States where union organization is impossible. Gary, Indiana and Longview, Washington are cited (in the present tense, but based on a 1938 footnote!) as "mill-towns" where workers are prevented from union organization by company domination; both of these cities have for a number of years been highly unionized.

This is emphatically a British book. The repeated use of abbreviations to designate English unions, of strike terms and working habits unfamiliar to American readers, and of episodes in English strike history which have little or no meaning to the American student demonstrate that while we both use the same language, colloquialisms, at times, make it difficult to comprehend what is being said.

One concluding question: Why the high

price of this book? In recent years we have seen book prices advance, along with those of most other commodities. Yet \$8.75 for a 330-page book, even with nearly 600 words in painfully small type on each page, seems excessive. As a believer in international trade, this reviewer cannot feel that it will be advanced greatly by this scholarly, but high priced, export item.

JOHN NEWTON THURBER

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HAYNES, WILLIAM WARREN. *Nationalization in Practice: The British Coal Industry*. Pp. xviii, 413. Boston: Harvard University School of Business Administration, 1953. \$4.00.

This painstaking and scrupulously fair study of the present-day British Coal Industry has two aspects of particular interest to political scientists—the analyses of, first, the administrative organization of the nationalized industry, and, second, the means by which the industry is made publicly accountable. In dealing with the administrative problems, Professor Haynes joins Edmund Burke in decrying, justifiably, "the closet philosophers" with, here, their organizational blueprints. He emphasizes that time must be allowed for an ethos to develop amongst the 750,000 employees, and that personal relations and a widely diffused understanding of the aims of the Coal Board are of far greater importance than any particular organizational principle.

To the problem of public accountability, Dr. Haynes gives only one chapter, despite its urgency for democracy and the Coal Board. Clearly the Board has been seriously affected in the decision-making process by the feeling that Parliament was "peering over its shoulder." Unfortunately in this connection, Dr. Haynes tends to confuse nationalization with government control and fails to make clear the considerable degree of independence accorded the Board by Parliament. For example, the Public Accounts Committee can only *examine* the published accounts and cannot

"investigate" them [p. 254 (5)]; likewise to describe the Coal Board as being "attached to the Ministry of Fuel and Power" (p. 102) much exaggerates the powers given the Minister by the Act.

Professor Haynes devotes the first quarter of the book to the prenatalization scene and includes a history of the industry; in the next third he describes the 1946 Act and the consequences thereof, especially for labor relations; and the rest, excepting two chapters on pricing and investment policy, is on the administrative organization. Had the first section been reduced, by referring the student to the very adequate sources—here fully acknowledged as being heavily drawn upon—space might have been found to analyze those problems which have arisen solely because of nationalization. This would have involved a comparison with other nationalized industries, with such ventures as TVA (the Tennessee Valley Authority), and with the histories of private businesses in the United States, many of which, in their earlier days, experienced problems very similar to those of the newly formed National Coal Board.

Undoubtedly this book could be used with advantage by an advanced seminar, or, if used alone, it provides a very comprehensive single textbook upon this industry, which is of such basic importance to the whole of the British economy.

HENRY MADDICK

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GOLLANCZ, VICTOR *My Dear Timothy: An Autobiographical Letter to His Grandson*. Pp. 439. New York: Simon & Schuster, 1952. \$5.00.

This book is a tonic, refreshing and energizing. The author, a successful British publisher, loves people, music, and life. He writes, "The world is so beautiful, I have always loved the world; it is because I cannot bear that it should suffer torture and deformation that I am writing this book."

During two long periods, when a young teacher of boys, he saw the good and beautiful in everything—in trees, people,

and objects. He saw himself in others in crowded railroad cars and saw others as part of himself. During one of these periods he was opposing Nazism and deeply moved by the suffering of the Jews when he was organizing the National Committee for Rescue from Nazi Terror.

Here is a sage who has compiled the wisdom of the sages of all periods and absorbed much of their wisdom, who was, at the same time, a successful business man and a political figure in England. Gollancz offset the stress and fret of business striving with a love of wisdom culled from the sages of all times and all cultures.

Another of his books, *Man and God*, a selection of passages chosen and arranged to express a mood about the human and divine, is rich with the wisdom of Jewish literature as well as that of Asia and Europe.

The writer is able to communicate his enthusiasm to the reader. He loves great music including Beethoven, noble architecture including Gothic, and would travel by rail from London to Paris in one day to hear his favorite opera singers, the next day returning at midnight to London.

During one period of his life he examined the rules of Jewish orthodoxy, and, if they did not make sense to him, he discarded them. He describes the long movement of his mind that carried him out of the intense Jewish orthodoxy of his upbringing into an engulfing preoccupation with the reality of Christ and yet never led him to cut the cord binding him to the traditions of his race.

Gollancz examines everything with a fresh eye, and therefore the reader sees afresh much he had previously taken for granted.

The writer's philosophy is that the combination of evil and our struggle against it is what makes us capable of reaching our best possibilities. Therefore, evil is a means toward good. When there is no struggle against evil there is no progress. The only serenity worth having comes after a successful struggle. This is certainly good medicine for our own age of struggle, and is prescribed by one who took this medicine in sufficient quantities to become a successful publicist, philanthropist,

orator, moral crusader, and all around human being.

OTTO T. MALLERY

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FINER, S. E. *The Life and Times of Sir Edwin Chadwick*. Pp. xi, 555. London: Methuen & Co. (distributed in the U. S. by The British Book Centre), 1952. \$9.00.

This is a careful scrutiny of the career of Edwin W. Chadwick, the British civil servant who probably is best known as the "father of the sanitary idea" and whose report on the *Sanitary Condition of the Labouring Population of Great Britain* (1842) set in motion the public health movement. The justification for a full-length biography is that the range and depth of Chadwick's influence in a period when modern British governmental institutions were forming has not been measured.

Professor Finer has worked his way through an array of documents and contemporary accounts (these are listed in an excellent bibliography) to produce a mature analysis of Chadwick's life. This book is distinguished not only by scholarship in the usual sense, but by a writing style that manages to keep interest alive throughout Chadwick's interminable controversies over the size of sewer pipe.

Chadwick was born in 1800 and early fell under the influence of Bentham and the Philosophical Radicals. He began his career in 1832 as an investigator for the Poor Law Inquiry. Subsequently he drafted the major portion of the report upon which the new legislation was based and served as secretary of the new Poor Law Commission. From the start, his ideas and methods generated opposition. Soon he was excluded from poor law matters, and in 1847, as the price of peace, he was dismissed.

Impressed by the connection he found between disease and pauperism, he had meanwhile begun the health inquiry. Ironically, this celebrated report escaped suppression only after a compromise was worked out whereby it was to appear under Chadwick's name, as his own opinions. The report won wide recognition and led to his appointment to the new general Board of

Health on which he served, again as the center of controversy, until 1854 when he was pensioned off. Although he hoped and tried to return to active service, Chadwick spent his last 36 years as a savant on the margins of officialdom. Events ultimately reshaped his reputation, and in the last year of his life he was knighted.

Chadwick's interests and activities ranged widely—police reform, child labor, tramways, and postal reform are some of the most important. He was a tireless digger for facts and a constructor of logical administrative systems. Although not an original thinker, he left his mark on nearly everything he touched. It was the systematizer in Chadwick which was at once his strength and his weakness. As Professor Finer says, he did not really understand that England was not "governed by logic, but by Parliament." Chadwick's perfect state was one in which the legislature—if there was one—obediently enacted the plans made by able bureaucrats. Thus, Chadwick's difficulties with his political superiors and the public were due only in part to an aggressive, dogmatic personality. At the root lay his antidemocratic bias—that policy should be made scientifically by experts whose prime aim would be to avoid waste. On Chadwick's side, it should be said that his political superiors were, with some exceptions, a mediocre lot.

Yet, despite these faults, Chadwick made notable contributions to sanitary reform and to the development of effective central-local government relationships. Perhaps his main achievement was the wide support evoked for the principle of sanitary reform; yet not until later was Parliament willing to say that no community had the right to be "dirty." Chadwick's impressive documentation and analysis of problems was a step forward, and perhaps was the most refreshing aspect of Benthamism at work in administration, coupled as it was with the belief that through knowledge man's lot could be bettered. Among Chadwick's accomplishments also should be cited the stimulus he gave public health pioneers elsewhere, like Shattuck in the United States.

JAMES R. DONOCHUE

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SLAVIC COUNTRIES

DEUTSCHER, ISAAC. *Russia: What Next?*
Pp. ix, 230. New York: Oxford University Press, 1953. \$3.00.

This is a clever and provocative little book, written in great haste during the weeks following the death of Stalin. It is saved from superficiality by the fact that the author has for some years been engaged in research in original sources on the life and times of Stalin and Trotsky. While many readers—and this reviewer is one of them—may consider that Mr. Deutscher's conclusions are far from convincing, the book certainly does give evidence that the author has long lived with his material. However, he has a very strong tendency to interpret this material schematically, in terms of a version of Marxism which owes much to Trotsky.

Despite the title of the work, about two-thirds of it is devoted to a brief history and analysis of the Soviet Union under Stalin. Most of what the author says in this portion of the book he has said before in his biography of Stalin and in journalistic articles. He seems to take a more negative attitude toward Stalin in this book, however, than in his well-known biography. Stalin, Deutscher argues, was the inevitable product of his time. Inferior to Trotsky in most respects, he defeated Trotsky because he alone among the Bolshevik leaders could preserve and carry on the revolutionary regime in isolated and backward Russia. But in his last years, Stalin became more and more of an anachronism. Stalinism was suffocating Russia in its last years. Yet Stalin, a slave to his past, could not change.

While Stalinism brought "primitive magic" into Russian Marxism, its economic achievements were destroying its reason for being. Deutscher eloquently presents statements and statistics regarding the progressive cultural revolution brought about by Stalin's economic policies. This is presented rather glibly, with a minimum of documentation. The author is at pains to demolish the arguments of anti-Soviet writers, including Soviet refugees, who have argued that the collective farm system, for example, was

unpopular and should be drastically modified. He is convinced that all elements in Soviet society are "socialist" and that both the collective farm system and the planned industrial system are accepted by all elements of the Soviet population and cannot be eliminated or radically changed. It is a pity that the work of the Soviet émigré, Herman Achminow, *Die Macht im Hintergrund*, which presents a completely opposed argument, is not available in English.

Now that Stalin is dead, continues Mr. Deutscher, there is a good chance for a "democratic regeneration" of Russia. Stalin created the necessary economic basis, and his successors can gradually restore Leninist democracy. The process, if it occurs at all, will be gradual and it will require peace, continues Mr. Deutscher. It is rather difficult to appraise Deutscher's arguments and conclusions, because they are stated in such vague and broad terms. Certainly no such concrete analysis of Soviet society is offered as would perhaps furnish a foundation for such optimistic conclusions. The Beria affair, which of course occurred after the book was published, casts some doubt on the author's insight into the power and personal relations among the new rulers. Mr. Deutscher apparently regarded Beria as a "Malenkov liberal." However, in fairness to Deutscher, it should be noted that not a single political commentator predicted Beria's downfall.

We should welcome this optimistic book, whose position is so different from that of most other writing on contemporary Soviet affairs. Taken with plenty of salt, and as a change from heavier fare, the book can be stimulating and refreshing. It is useful to be reminded again that Russia is the least static of the great powers, that it is changing rapidly, and that the Western World will have to be imaginative, alert, and constructive in order to cope with its challenge. This, I think, is the greatest merit of Deutscher's book.

At the same time, the strong element of wishful thinking in the book serves as a warning of some of the attitudes and ideas with which American policy and our information services, if they are allowed to function, will have to cope increasingly in

the future. There is a great deal of vagueness and looseness in statement, and a few serious errors of fact, such as the assertion that the attack on Varga began in 1946 (instead of 1947) or that Beria was "called in by Stalin" in 1939 (actually in 1938). Much more serious are the glib, ambiguous, and often misleading or almost meaningless statements which occur here and there in the book. Let us hope that Mr. Deutsch's prophecies will bring a bit of sweetness and light to angry pessimists, without plunging wishful thinkers more deeply into their illusions.

FREDERICK C. BARGHOORN

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Soviet Science. A symposium arranged by CONWAY ZIRKLE and HOWARD A. MEYERHOFF. Edited by RUTH C. CHRISTMAN. Pp. vii, 108. Washington, D. C.: American Association for the Advancement of Science, 1952. \$1.25.

This is a symposium consisting of papers delivered at the Philadelphia meeting of the American Association for the Advancement of Science in December 1951. All have been prepared by scholars thoroughly familiar with the state of particular branches of science in the Soviet Union. Seven are devoted, respectively, to genetics, physiology, psychology (including psychiatry), the social sciences, soil science, physics and chemistry, and mathematics. The eighth deals with science and intellectual freedom in general; the last, written by Conway Zirkle, is a general appraisal. Most of the papers discuss not only the state of science in Russia today, but also its state on the eve of the revolution. The contributors agree that Russian science, though young, was already an important phase in the advancement of science on the international level.

Naturally, the sad story of science under the Soviets occupies the major part of the papers. The situation varies from field to field. Mathematics, in practice, is free from interference. In physics and chemistry, the impact of Communism is confined to the imposition, on the scholars, of an obligation to pay lip service to the great masters of Marxism and to denounce "the idealistic science of the West." But

genetics, physiology, psychology, and soil science are badly hurt. In each field, a kind of official deification of one or another authority, similar to the official worship of the late Stalin, prevents the scholars from reasoning along truly scientific lines and forces them to make statements which they know to be wrong. Even when the authority is well chosen, such as Ivar Pavlov in physiology, the men of science are inhibited in their efforts by not being allowed to go beyond the statements of the masters; this condemns them to sterility. In genetics, they must, in fact, go back to Lamarck.

Unfortunately, the paper on the social sciences, which is probably the subject of greatest interest to the readers of *THE ANNALS*, is the least satisfactory in the symposium. The author, R. L. Ackoff, confines himself to generalizations about the low status of the social sciences in the Soviet Union, the dominance of historical research and subservience to propaganda purposes of the government. Quite interesting stories, parallel to those concerning themselves with the natural sciences, could be told relative to economics and jurisprudence. The identification of sociology with historical materialism could have formed another interesting chapter. One misses also the discussion of linguistics where the development has been spectacular: after 25 years of unquestioned dominance of the doctrine of Ya. Marr, Stalin's edict on linguistics (of June 20, 1950) caused a kind of counter-revolution.

Despite these omissions, the volume contributes much valuable material to the sociology of knowledge, more exactly, to a yet unwritten chapter on directed, or managed, knowledge. A comparison of the state of Russian science before and after the Communist revolution points to a significant impoverishment of culture. "We are all poorer because Russian science has been injured by Communism," says Zirkle in one of the last sentences of his concise and illuminating appraisal.

N. S. TIMASHEFF

Fordham University

TOMASIC, DINKO. *The Impact of Russian Culture on Soviet Communism.* Pp. 287.

Glencoe, Ill.: The Free Press, 1953. \$4.50.

No thinking man can in these days fail to be challenged by the question of the sources of Russian conduct. The search for satisfying explanations of past behavior and future reactions on the part of Soviet leaders and followers goes on endlessly. Are geographical factors basic? Is race, in spite of our reluctance to resort to racial thinking, a clue to the enigma? Or are personality and policy, whatever their remoter causes, fundamentally Russian rather than Communist, going back perhaps to Rurik and to Byzantium in a history and tradition more than millennial? Power-mad cliques and individuals are the explanation of many. Still others attach real importance to Marxism-Leninism and its teachings in the production of a new and different Russia. Of these and other factors the possible combinations are almost infinite, and from Custine to Crankshaw, John Fischer, Soloveytschik, Barrington Moore, Berdyaev, and Gurian the changes have been rung on them.

It is my belief that no one has written of these problems more judiciously, with fuller knowledge, or with greater wisdom than Professor Tomasic. It is a shame that the jargon which he has picked up from American social science and the slow chronological progress he makes from the most remote history to today's newspaper will discourage many readers. Those who persevere will find their reward in an understanding of the Russians which owes little to the superficialities of statistics, nor does it egregiously abuse intuition.

By examining seriatim the ancestral society of steppe warriors and of Old Slavonic plowmen Tomasic concludes that there was a blend of "two conflicting worlds" that "formed the basis of Russian Society." Nomadic invasions completely shattered "the social stability which existed in the Old-Slavic Society" and already led to a "sense of emotional and physical insecurity which fostered destructive aggression and mass violence." We begin to see the relevance to our contemporary situation. The Byzantine church helped to foster complete dependency and fatalistic resignation rather than personal and social

responsibility. That a resigned people is also a revolting people Tomasic is quite aware, and he has a partial explanation in the eighteenth-century reforms which undermined the whole realm of the sacred.

The structure of Russian Society is followed into family life and personality in a rather successful effort to understand the total context. Totally unsatisfactory to a Communist, and partially unsatisfactory to any Russian, Tomasic's study seems to this reader, who is neither, as well rounded and insightful as anything we have. Or am I merely taken in by an interpretation of history so up to date that it can talk with the psychiatrists of the release and redirection of hostilities?

W. REX CRAWFORD

Salzburg Seminar in American Studies

GURIAN, WALDEMAR (Ed.). *Soviet Imperialism: Its Origins and Tactics*. Pp. vii, 166. Notre Dame: University of Notre Dame Press, 1953. \$3.75.

This symposium has more unity than most. The contributors have conscientiously adhered to the question posed: Is Russian Imperialism or Soviet Communism the enemy? They are divided in their answers to the question and have approached it from different vantage points which do not overlap.

N. S. Timasheff argues that the Soviet territorial acquisitions in 1918-22, 1939-40 and 1944-45 would probably have been made by even a non-Communist government of Russia. The formation of the satellite states and the conquest of China, however, are at variance with the historical pattern of Russian expansion.

Richard Pipes finds that Russia's Mohammedan subjects fared better under czarism than under Communist rule. The Soviet policies of Russification and genocide make Communist expansion a historically new phenomenon in his opinion.

Frederick Barghoorn's analysis reveals that the Soviets have chosen the symbols of nationalism to disguise their totalitarianism. He stresses that the major propaganda themes in the Union of Soviet Socialist Republics continue to be Marxist rather than Russian.

Michael Pap asserts that the fate of the Ukraine under the Czars and the Reds has been much the same, except that the latter have been more vigorous in their imperialist policy of suppressing non-Russian people.

Soviet policy in Poland is a continuation of Russian imperialism by different means, according to Wiktor Weintraub. For example, the Czar tried to Russify the Poles by school curricula in the Russian language; the Soviets use Russian books in Polish translation instead.

Ling Nai-jui argues that the objectives of Soviet diplomacy in China are identical with those of the Czar.

The book does not convince the reader of the practical importance of the dichotomy: Russian Imperialism versus Soviet Communism. America is faced with a double-barrelled shotgun—the Communist ideology and its 1953-homeland. Both barrels are aimed in the same direction by the same marksman for the same expansionist purpose. To attempt to disassociate one from the other is to disregard deadly reality. Even assuming such disassociation were possible and that, for example, the enemy were found to be “old-fashioned imperialism” and not Communism, could such imperialism be resisted in this age of bi-polar power, H-bombs, and psychological warfare as it was in the era of classical imperialism? Or, what is the threat of an ideology not backed up by guns and a strong home-base? The attempt to isolate factors of Russian expansionism from Soviet expansionism may be useful in academic analysis; the usefulness for policy formation is not persuasively demonstrated in this otherwise excellent and informative volume.

C. DALE FULLER

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BERGSON, ABRAM. *Soviet National Income and Product in 1937*. Pp. xi, 156. New York: Columbia University Press, 1953. \$3.75.

While this is a monograph for specialists, its results should be of wide general interest. Professor Bergson has reconstructed, from hundreds of pieces of detailed evi-

dence in Soviet sources, an organized set of national income and product accounts for the Union of Soviet Socialist Republics in 1937. They give a cross-section view of the Soviet economy which permits objective measurement of many features of the Soviet system hitherto discussed mainly in strident political slogans.

The study surmounts formidable problems. Probably the most difficult relate to the lack of institutional correspondence between Soviet and American society. This is, of course, far more than a statistical or definitional problem; social and legal contrasts prevent any simple transfer of familiar concepts. The author, himself a notable contributor to the pure theory of income analysis, devotes a portion of this essay to broad consideration of the content of his statistical boxes. A derivative set of problems arises in eliminating various taxes and subsidies in order to approximate the desired categories. The underlying problems of ferreting out adequate raw data, while by no means negligible, were not as prohibitive as might be supposed. Students of the U.S.S.R. have found that official Soviet data are not, in general, pure fabrications. Concealment rather than invention seems to be the rule, and 1937 was chosen partly as the last year for which relatively abundant information had been released.

In simplified form, one of the fundamental differences between the Soviet economy and our own can be seen from the following percentage breakdown of the use made of the two gross national products (derived from data on pages 75 and 95):

	U.S.	U.S.S.R.
Consumption	74%	55%
Gross investment	15%	23%
Government	11%	21%

The forced industrialization drive of the Bolshevik regime has channeled almost a quarter of the country's output into gross capital formation. As a consequence, Soviet citizens are left with a much smaller share of the pie, and of course the Soviet pie is much smaller than the American to begin with, especially on a per capita basis.

For details of Professor Bergson's other

interesting findings, such as the enormous role of sales taxes, the continued massive share of agriculture in this "industrialized" economy, and the presence of "surplus value" in the U.S.S.R., the reader may profitably consult the text itself. Its 99 pages (plus 45 pages of appendixes) do not make easy reading, but they provide objective, scholarly evidence bearing on crucial issues of our time. For example, those concerned with the theory and practice of "Point Four" development overseas would do well to examine this study for comparative insight on the limitations of totalitarian industrialization.

HOLLAND HUNTER

Haverford College

SWETTENHAM, JOHN ALEXANDER. *The Tragedy of the Baltic States: A Report Compiled from Official Documents and Eyewitnesses' Stories*. Pp. xi, 216. London: Hollis and Carter (distributed in the U. S. by The British Book Centre), 1953. \$2.75.

The author, a former member of the Displaced Persons Division of the British Control Commission for Germany, has compiled a report from official documents and eyewitnesses' stories, in the hope, he says, that the countries which have opened their doors to the Baltic refugees will understand something of their background and will welcome and love them as they deserve.

His summary of history of the Estonian, Latvian, and Lithuanian nations—the record of their economic, social, and cultural achievements during the twenty years of political independence and the story of their forcible incorporation into the Soviet Union—is indeed an interwoven pattern of texts and facts, but also a seizing narration.

Mr. Swettenham gives a first-hand illustration of the conditions in which the 250,000 Baltic refugees had to live in Germany and other countries, that were only "a transit halt" (Britain included). In July, 1947, the message to Congress of President Truman opened the gates of the United States to substantial numbers of the Balts. Those admitted under the Displaced Persons Act of 1948 showed them-

selves "hardy and resourceful" as the President expected them to be. Yet so many thousands were left behind. May the special immigration bill of 1953 now give a new chance to these qualified witnesses and resisters against Communist imperialism and slavery.

The Tragedy of the Baltic States is a valuable contribution to the record of the Nazi-Soviet conspiracy, of which the Poles, Balts, and Finns were the first victims. It arrives in proper time, when a special committee of the United States House of Representatives is engaged in investigation of the predatory proceedings by which the Baltic States have been pushed in the Soviet tideway.

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WESTERN CONTINENTAL EUROPE

HITLER, ADOLF. *Hitler's Secret Conversations, 1941-1944*. With an introduction by H. R. Trevor-Roper. Pp. xxxi, 597. New York: Farrar, Straus & Young, 1953. \$6.50.

The character is a familiar one in every German *Bierstube*. Self-educated, shrewd, arrogant, he holds forth on every subject under the sun, from food to world politics, from music to military tactics. Pompous and omniscient, he refuses to discuss his ideas but, instead, issues dicta and ukases. He mistakes his intuitions for scientific fact. He knows all the answers to the meaning of history. He lives in a curious dream world and dismisses as insane anyone who disagrees with his judgments and disconnected monologues.

Adolf Hitler's unguarded, all-night, off-the-record table talks were taken down in shorthand by his party associates. A few quotations will suffice to give the quality of the mind of this fanatically egocentric, hate-laden dictator: *Racial Nonsense*: "It's our duty continually to arouse the forces that slumber in our people's blood" (p. 29). *Self-glorification*: "There was a time when one could say that there was *only* one Prussian in Europe and that he lived in

Rome. . . . There was a second Prussian. He lived in Munich, and was myself" (p. 66). *Delusions of Grandeur*: "When one enters the Reich Chancellery, one should have the feeling that one is visiting the master of the world" (p. 67) *Psychotic Suspicions*: "I never met an Englishman who . . . didn't say [Churchill] was off his head" (p. 153). "There's no doubt about it, [Roosevelt] is a sick brain" (p. 147). *Hostility*: "There's nobody stupider than the Americans. . . . I'll never believe the American soldier can fight like a hero" (p. 149).

Some of the world's worst literature is paraphrased here in Hitler's familiar gutter style, including Arthur de Gobineau's *Essay on the Inequality of Human Races*, Houston Stewart Chamberlain's *Foundations of the Nineteenth Century*, Alfred Rosenberg's *Myth of the Twentieth Century* (though Hitler denies any debt to Rosenberg), *The Protocols of the Elders of Zion*, and an ill-digested assortment of interpretations of Nietzsche, Schopenhauer, Mackinder, Haushofer, Frederick the Great, and Carlyle. One can imagine what kind of civilization would have emerged had this hypomaniac succeeded in his ambition of conquering the world.

In a brilliant introduction, Trevor-Roper describes this mind: "A terrible phenomenon, imposing indeed in its granite harshness and yet infinitely squalid in its miscellaneous clutter—like some huge barbarian monolith, the expression of giant strength and savage genius, surrounded by a festering heap of refuse—old tins and dead vermin, ashes and eggshells and ordure—the intellectual *detritus* of centuries" (pp. xxix–xxx). Yet, despite Trevor-Roper's extraordinarily keen analysis, it is becoming increasingly clear that an understanding of the mind of Hitler cannot be achieved by the historian without the assistance of the psychologist, the psychiatrist, and the psychoanalyst. Clues in Hitler's reading give only a part of the story. His character, like that of every human being, was molded in his early years by the acculturation process of interpersonal relations. The fears, anxieties, hatreds, and hostilities, the neuroses and psychoses exhibited on every page of this book, call for study by those

specialists whose first concern is with abnormal behavior. The historian can note objectively that Hitler rationalized mass murder and slave labor; the psychiatrist is better equipped to learn why he held such views.

Trevor-Roper judges these talkfests as indisputably authentic. Hitler, in his colossal vanity, undoubtedly believed that this record would take a place alongside Eckermann's *Gespräche mit Goethe*. As a contribution to world literature, it reaches the level of *Mein Kampf*.

LOUIS L. SNYDER

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PASCAL, ROY. *The German Sturm und Drang*. Pp. xvi, 347. New York: Philosophical Library, 1953. \$4.75.

The Romantic movement of the early nineteenth century was heralded throughout the Western World by premonitory stirrings, passionate outbursts, and prophetic voices which disturbed the philosophical composure of the Age of Reason and Enlightenment. Nowhere was this prelude to the Romantic revelry more powerfully intoned than in Germany, the country that, exhausted and disunited after the devastation of the Thirty Years' War, had long been the Lazarus in the community of European nations. The movement, called *Sturm und Drang* after a play by Klinger, ushered in the Renaissance of German literature and philosophy which was to reach its climax in the republic of letters at the court of Weimar. Goethe and Schiller, later the central figures of this "Court of the Muses," belonged with their early works in *Sturm und Drang*, though Schiller had no personal contacts with the group of writers whose chief members were Hamann, Herder, Goethe, Merck, Lenz, and Klinger.

Professor Pascal, postponing to a later volume the critical analysis and appraisal of *Sturm und Drang's* poetic and literary achievements, devotes his attention chiefly to persons and ideas. He distinguishes and competently discusses the various aspects of the *Weltanschauung* which emerged in the treatises, plays, and poetic outpourings of those literary men who were revo-

lutionists of a peculiar type. Their metaphysical ardor and the remoteness of their thought from contemporary reality blunted the edge of their scathing criticism of society. Their rebellious strokes were designed to overturn minds and sensibilities rather than thrones. One by one their ideas concerning the state, social classes, religion, genius, reality, history, and poetics are competently reviewed and analyzed in Professor Pascal's scholarly study. This departmentalization of a living thought, closely interwoven and richly individualized as it was, prevents the critic from achieving the grandly synoptic picture which seems warranted by his subject-matter. On the other hand, clarity, comprehensiveness, and balance of exposition are the rewards of a method employed by the author with openness of mind and fairness of judgment. As an introductory survey the book is highly to be valued.

HELMUT KUHN

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OTHERS

KIRK, GEORGE E. *The Middle East in the War (1939-1946)*. With an Introduction by Arnold J. Toynbee. Pp. xiii, 311. Second Impression, Revised. New York: Oxford University Press, 1953. \$10.00.

This is a volume of "The Survey of International Affairs," covering the war period of 1939-1945 and devoted to the general area of the Middle East, published by the Royal Institute of International Affairs, under the editorship of Professor Arnold J. Toynbee. While a few sections have been written by specialists, Mr. Kirk, the author of the great body of the volume, is already well known for his *Short History of the Middle East* (1946) and other works.

Essentially the volume is divided into four parts which deal with (I) Political Motives in the Middle East, 1939-1945, including a discussion of Arab nationalism, Zionism, and the interests of the major powers in the region; (II) The Development of the War to El Alamein, 1939-

1942; (III) The Recession of the War, 1943-1945; and (IV) The USSR and the Middle East, 1939-1945. Within this framework, Mr. Kirk treats not only of military operations in the Middle East, but of the effects of the war on the peoples, governments, and national movements during the period, together with the political and economic policies of the belligerents as thus far known on the basis of available evidence. Particularly interesting, in this connection, are the discussions of the Arab national movements, for example, in Morocco, Tunis, the former Italian colonies, Egypt, the Levant States, and Iraq, and the development of Zionism, which ultimately (1948) led to the establishment of the state of Israel. The contribution of Mr. Guy Hunter concerning The Middle East Supply Center is a very welcome and succinct account of this important aspect of operations in the Middle East during World War II. A special section is devoted to the USSR in the Middle East, more particularly to its policies and activities in Turkey, Iran, and the Arab States, although Soviet interest in the area as a whole is discussed in other parts of the volume as well.

Informed opinion will vary as to the author's treatment of different aspects of his story, which is necessarily fragmentary in spots. Nor is the evidence by any means "complete" for so recent a period of history. Although only first published late in 1952, the volume has already been revised, apparently because of some of the author's reflections as to the problem of Zionism and Palestine. It may be doubted that French students of the Middle East will be much pleased by his treatment of the French position; either in North Africa or in the Levant States, during this period. The author might well have filled out the picture of Soviet policy, especially among the Arab States. Leaving these matters aside, however, *The Middle East in the War* should be required reading for all serious students of Middle Eastern problems, for it is not only well written and generally well balanced and objective, but it is the product of very extensive research and study. Another volume, covering the period since 1946, should pull the story

neatly together, and should well serve the end of a better understanding of this highly critical area in a much-troubled world.

HARVEY N. HOWARD

Arlington, Virginia

STAMP, L. DUDLEY. *Africa: A Study in Tropical Development*. Pp. vii, 568. New York: John Wiley and Sons, 1953. \$8.50.

This new geography textbook on Africa comes at a time when interest in that continent is growing at a very rapid rate because of postwar economic and political developments in almost every major part of Africa. Professor Stamp, one of the best-known British geographers, places his emphasis on tropical Africa, although his book covers the entire continent from the Mediterranean shores to the Cape of Good Hope.

The book is divided into three parts. Part One: *The African Continent* treats the physical and cultural aspects of the continent as a whole. Special chapters are devoted to the history of exploration and partition, geology, climate and water, soils, vegetation, peoples and their ways of life, diseases, and transportation. Part Two: *The Countries and Regions of Africa* consists of eleven regional chapters, of which six are devoted to tropical Africa, one each to South Africa and the African seas and islands, and three to North Africa and the Sahara. The organization of these regional chapters varies somewhat, but in almost every instance each chapter presents the essential features of the physical environment, a brief sketch of the historical background, and a picture of the peoples and political organization, and discusses then quite fully the modern economic development, trends, and problems. Part III: *Africa Today* is disappointingly short, having only one brief chapter treating rather superficially past, present, and future problems.

It was a good idea to keep statistical data as much as possible out of the regional chapters and present them in a *Statistical Summary* that can be easily kept up to date. Wherever possible, the pertinent data on population, land use, crop

acreage, livestock, mineral production, and trade are given.

The purpose of the book, according to its author, is to look at the continent dispassionately and objectively, without racial or political bias, "to consider its geographical background as an environment for human activity and to study the responses which have been evoked from its African inhabitants and those who, in the last few centuries, have penetrated its fastnesses and molded its fortunes." Here in Africa we find side by side the colonial dependencies of Britain, France, Belgium, Portugal, Italy, and Spain, which invites comparisons. Each one of these colonial powers pursues its own policy in guiding the growing political consciousness of its African subjects; but the policy is greatly affected by the size of the European population and its role as either permanent settlers or sojourners. The distribution of European sojourners and permanent settlers, as well as many other problems, can be understood only when examined in its geographical setting. Rightfully so, Professor Stamp stresses that to a large degree man's life in Africa is controlled by the physical environment, in particular by the geofactor water.

The book is well illustrated with photographs and has excellent maps. Some of the chapters have a brief bibliography at the end, others have footnotes. Occasionally one comes across an interesting quotation, the source of which is not given either in a footnote or in the bibliography at the end of the chapter. It is hoped that this will be corrected in a later edition. The book will be welcomed not only by geographers but also by other social scientists who are looking for a modern geographical treatment of Africa.

KARL J. PELZER

Yale University

THAYER, PHILIP W. (Ed.). *Southeast Asia in the Coming World*. Foreword by William O. Douglas. Pp. xii, 306. Baltimore: Johns Hopkins Press, 1953. \$4.75

Southeast Asia today is not the unknown area it earlier was in the United States. The early postwar years have seen a num-

ber of volumes providing at least an overview of the culture, economy, and political status of the millions of inhabitants of Burma, Thailand, Indo-China, Malaya, Indonesia, and the Philippines. The stage has now been set for a presentation of basic problems facing emerging or newly-created states of Southeast Asia.

In the summer of 1952 a conference on "Southeast Asia in the Coming World" was sponsored by the School of Advanced International Studies of the Johns Hopkins University. Twenty-one conference papers form the contents of this book, mostly written by Americans who have studied the area, while several contributions come from Southeast Asians.

Five papers falling under "Political Science" discuss our foreign policy in Southeast Asia. The efforts of these authors, recognized as authorities, provide insight into our past, present, and future political relations to individual Southeast Asian states. Another five papers deal with "Economics," covering aspects of what may well be crucial factors in the current position of these states. Included are a contribution from Professor Dobby of Malaya on "Food and the Changing Function of Southeast Asia," as well as one from Professor Vu Quoc Thong of Hanoi on future economic development of Vietnam. "Ideological Problems in Southeast Asia," by Richard Gard, introduces the part entitled "Culture" providing an exposition of concepts basic to development of Southeast Asia in future decades. Implications of these concepts underlie contributions throughout the volume. The effect on Southeast Asia of cultural borrowing, including communism, makes up the remainder of this part. The fourth part is devoted to "Law," a welcome addition since law is frequently neglected in general area studies. Illuminating papers are offered by the Rector of the University of Rangoon and the President of the University of Indonesia both dealing with the customary or adat law of their respective countries. The role of Southeast Asia in international law and in international relations is also presented. The last part, "Proposals for the Future," seems repetitive

since all authors dealt with the future, as well as the past and the present. The final paper adds something new, however, in highlighting possible interaction between American and Southeast Asian universities.

An extraordinary amount of effort is evident, in the lucid presentation to educator, government policy maker, businessman, or interested general public, of the problems which must be met and solved if there is to be integration of Southeast Asia into the modern world. We need detailed documented studies of various segments of political, economic, and social life of Southeast Asia in the United States, supplementing the many prewar Dutch, French, and English studies. This volume poses the questions. We cannot be satisfied until facts upon which the definitive solution must depend are further investigated.

A. ARTHUR SCHILLER

Columbia University
School of Law

ZINKIN, MAURICE. *Asia and the West*
Pp. xii, 304. New York: Institute of
Pacific Relations, 1953. \$3.50.

At the very outset this reviewer must indicate that he does not agree with some statements made by the author, such as: "The West did not set out on a deliberate tour of conquest [of Asia]. As a rule it went to the East to trade, and its blind weight broke the Eastern countries." According to the author, the very fact that Japan did not become a victim of Western expansion "is an interesting proof that Europe was not bent on conquest for its own sake. It was trying, more or less consciously to create political systems which would stand the wear and tear of industrial age." This statement is a very inadequate rationalization to support Western imperialism and conquest of Asia, as if to help the peoples of Asia, which is not historical fact.

Asia and the West is, however, an excellent study of social and economic conditions of Southeast Asian countries. One chapter is on "the Eastern Village and Western City," implying that the very idea of city is Western. If the Oriental industrial cities of modern type are of recent

growth, they have grown fast. The modern cities of the West are the outgrowth of industrial revolution, but this is also the case in the Orient. The patterns of social changes in the East and West are not entirely different in character, but the time element makes the difference striking.

The author makes it clear that during the quarter century of Japanese occupation of Manchukuo outside investment and industrial development surpassed anything the Western powers had accomplished in their colonies. But he thinks that such a development did not benefit the Chinese workers. The reviewer thinks the author has a double standard in appraising British imperialism in India and Japanese imperialism in Korea.

The author suggests that America has lost China because we supported the Kuomintang and Chiang-kai Shek and cites "the White Paper on China" to substantiate his position.

The author believes that the future of Asia as it will affect the West will depend on what happens in India. The real purpose of the book can be deduced from the following passage: "The Indian sub-continent, and in particular India, dominate the whole area from Aden to New Guinea. If they go, all Asia will go with them. If they can give their people food as well as freedom, factories as well as democracy, then Communism will be stopped on the Chinese borders more effectively than by many divisions. Asia is determined to be richer, even if it means liquidation on the Chinese scale, but it would prefer its bread without bullets. There could be no better investment for America than to help India and Pakistan in showing that liquidations are not essential to welfare. This book is intended as a contribution to the study of the Asian background against which such a policy must be planned."

In one chapter Zinkin examines the Five Year Plan of India. He indicates that India needs foreign capital investment, but needs sums much smaller than those given to Japan and Germany by the United States. In the Postscript he pleads: "Whether Communism or democracy is chosen [by the Asian people] will depend

not on ideologies but on facts. If the West, which in this context means the Commonwealth and the United States, wants freedom to win, then it must make sure that India offers a more successful model for imitation than China. That will be expensive; it may cost as much as £200 million a year for India alone; and other countries will doubtless want their share. But it is much cheaper than a series of Koreas."

The book is a valuable contribution in the field of Asian affairs.

TARAKNATH DAS

Columbia University
and New York University

HSU, FRANCIS L. K. *Americans and Chinese: Two Ways of Life*. Pp xix, 457. New York: Henry Schuman, 1953. \$6.00.

This book includes a stimulating and instructive analysis of Chinese culture. But even more enlightening to Americans is its objective and thought-provoking analysis of our culture. The author, a Chinese cultural anthropologist who completed his graduate training in England and has lived for nearly a decade in the United States, is unusually well qualified to make such a study.

It is Professor Hsu's basic premise that the American and Chinese ways of life are in diametric contrast, with the American individual-centered and highly emotional and the Chinese situation-centered and little swayed by his emotions. These contrasts appear to be somewhat forced at times, but the author is honest enough not to allow his theories to prevent the presentation of the pertinent facts. The facts tend to support the individual- versus situation-centered part of the premise; it is more difficult to accept without reservations the author's conclusions about emotions.

Part One of this book is concerned primarily with the origin of differences in the American and Chinese ways of life in the family and in the school. Part Two examines the differences in the psychological orientation of Americans and Chinese as illustrated in their attitudes toward mar-

riage, class, personal success, government, economic life, and religion. Part Three is devoted to American problems, Chinese weaknesses, and the challenge of Communism to both societies.

In the opinion of the reviewer the author is most convincing when discussing social and political phenomena. Students of religion are likely to question various points in his interpretations of Buddhism and Christianity; and his brief excursions into art and literature are so weak that they would have been better omitted altogether. Some historians of China will feel that he underrates the changes that have occurred in the Chinese way of life during the twentieth century, that he does not distinguish sufficiently between traditional and contemporary Chinese society. But it must be said that he is consistent in upholding the thesis that there is no essential difference between Chinese attitudes today and those of the past—that the recent changes in China are no more than adjustments that have been compelled by the aggravation of ancient ills by the impact of the West. Even the acceptance of Communism is no more than the latest attempt to solve such problems. While recognizing the risk that Communism may change China, Professor Hsu feels that it is at least as likely that China will change Communism. Moreover, he believes that "despite the fact that Communists have triumphed in China while they have at least been brought to a temporary standstill in the West, . . . in the long run the West stands in more serious danger of succumbing totally and irrevocably to Communism or some other brand of totalitarianism than does China" (p. 435).

The book is clearly written, with occasional summaries that are helpful to the general reader. It grinds no political ax, and is fresh and stimulating. Its occasional sweeping generalizations and exaggerations are presumably intended to emphasize important points or to provoke thought. It is to be hoped that *Americans and Chinese* will reach a wide audience, for it could be read with profit by all Americans.

KNIGHT BIGGERSTAFF

Cornell University

MORAES, FRANK. *Report on Mao's China*. Pp. 212. New York: The Macmillan Company, 1953. \$3.75.

This readable, informative, and impressionistic account of Communist China today is written by an experienced Indian journalist. Mr. Moraes was in Chungking and Kunming as a war correspondent in 1944 and 1945 and made a tour of Communist China from April to June 1952 as a member of the Government of India's cultural delegation. Mr. Moraes covers all the main aspects of China today—the look of the towns and the countryside, relationships with Moscow, brain-washing, public works, the top Communist leaders, the emancipation of women, economics, culture, hate campaigns, and foreigners, both friendly and unfriendly, still resident in China. He concludes with a somewhat forced comparison between Gandhi, Nehru, and Mao, and some interesting comments on India and China.

Mr. Moraes looks at the world through the spectacles of his own country, but he is definitely anti-Communist and far more objective about what he sees in China than have been a good many American reporters. He feels that the Communist regime depends on the army first, and on propaganda second. The brain-washing of the young is more important than that of the old. Russian influence is strong and growing stronger. Mao emerges as a realistic and practical man who uses Marxism-Leninism as a useful tool in gaining power. He will be no Tito. His greatest weakness is his ignorance of the West.

The effort to emancipate women from the old family system is not going as rapidly as had been hoped, but the liberated ones are quickly harnessed to the all-powerful State. The theme of the all-powerful State runs through everything—culture, education, politics. Mr. Moraes in fact feels that democratic India and totalitarian China are struggling for the leadership of Asia.

Mr. Moraes sees the Chinese side of the Korean conflict more sympathetically than we do. It is hard to follow his argument that United States policy has driven Peking into the arms of Moscow—especially in view of his scoffing at the possi-

bility of Titoism. On the other hand, one can agree that China would like an easing of the tension in Korea in order to avoid a continual drain on her manpower and resources. "In other words, she wants neither war nor peace but a state of stalemate calculated to tie up the U. S. forces in Korea without placing too much stress and strain on her own economy." Mr. Moraes has no illusions about the ambitions and designs of a militaristic Communist China.

GEORGE E. TAYLOR

University of Washington
Seattle, Washington

SAVAGE, HOWARD J. *Fruit of an Impulse: Forty-Five Years of the Carnegie Foundation, 1905-1950* Pp. viii, 407. New York: Harcourt, Brace and Company, 1953. \$6 00.

This strangely titled book is an able history of the Carnegie Foundation for the Advancement of Teaching, written on assignment by Howard J. Savage, staff member of the Foundation since 1923. It joins a rising tide of similar foundation histories, ten- and five-year summaries, and newly initiated annual reports, all testifying to a quickening consciousness within foundations of accountability to the public and the necessity for a wider understanding of this relatively new instrument of philanthropy if its greatest asset, full freedom to experiment, is to survive.

One approaches staff-written histories with misgivings. Will it be a glory book, or a dull catalogue of dates and names? This one is neither. It has its arid patches and shows no genius for portraiture, but it does have pleasant narrative touches and presents an important institutional history with every attempt at honest objectivity. Outstanding successes are duly noted, such as Abraham Flexner's notable report on medical education—though Mr. Savage gives too modest an account of his own dynamiting inquiry into college athletics. Failures and near misses, too, are noted. For example, *Bulletin No. 5* "was not too favorably received. Some scientists saw it as showing little comprehension of what a university was all about." Tremendous

controversies raged about the Foundation when long-lived annuitants, falling interest rates, and—it is frankly admitted—inadequate preliminary study forced a reduction in the retirement allowances professors were expecting. These are noted and the problem is explained at great length, though it was too much to expect that the most vituperative comment would be presented.

For the student of philanthropy here is the documented history, covering nearly half a century, of a simple, even naïve, attempt to do good with ten million dollars, and its unexpected results to the whole field of American higher education. Andrew Carnegie saw college professors, grown old in worthy service, living on in penury; he decided to help them with free pensions. But free pensions were not a good idea. Mr. Savage admits that in the light of present-day knowledge Mr. Carnegie's "gift to the teachers might have taken another form. Conceivably it would not have been made at all." It was made, but with unexpected consequences. Since the pensions were for "college" teachers, it became necessary to define acceptable colleges. The attempts of colleges to qualify worked a revolution in the standards of higher education.

Meanwhile the Foundation's firm-minded president, Henry S. Pritchett, saw the educational studies of the Foundation as potentially more important than the pensions, and after years of resistance won over Mr. Carnegie to permitting a modestly endowed Division of Educational Enquiry—a shift in course which the winds of experience have brought to many other philanthropists and endowed charities. The pensions, even when later curtailed, demanded many more millions than Mr. Carnegie originally gave or intended. The research program, helped though it was by grants from the Carnegie Corporation, seldom had substantial funds; but under direction of presidents Pritchett, Henry Suzzallo, Walter A. Jessup, and Oliver C. Carmichael (who has just resigned) it has made outstanding contributions to American education.

F. EMERSON ANDREWS

Russell Sage Foundation
New York City

DAHL, ROBERT A., and CHARLES E. LIND-BLOM. *Politics, Economics and Welfare*. Pp. xxvi, 557. New York: Harper & Brothers, 1953. \$5.00.

This is a book which needs and deserves to be read more than once. Its forays into the further reaches of economics and political science, its carefully reasoned construction of a conceptual framework, and its use of a technical and in some part novel vocabulary—all make the book difficult reading. But its virtues demand the effort and justify the advertised enthusiasm of those who read the manuscript in draft and pronounced it "first-rate."

In an immediate sense, the book is the result of collaboration between two Yale professors, one a political scientist and the other an economist. Having discovered some years ago that their separate seminars on "planning" differed more in terminology than in content, the two formed a partnership in teaching and in ideas. The result was a joint seminar, and the use of the combined theoretical and technical resources of two disciplines to provide the beginning of an answer to their basic question: "What are the conditions under which numerous individuals can maximize the attainment of their goals through the use of social mechanisms?"

Their "beginning of an answer" is impressive, both in substance and in method. Though no summary can do it justice, the gist of their answer is carried in the following set of propositions:

1). Welfare must be treated as a broad concept, embracing the ultimate and immediate goals of both the "political" and the "economic" man.

2). The essential requirement in maximizing welfare is not that a once-for-all choice be made between the extreme alternatives posed in the Great (but passing) Debate over Planning and the isms. Maximizing welfare requires a commitment, not so much to a particular set of means as to the general processes of rational calculation and control; and these in turn require a great variety of specific and changing techniques.

3). Choice of these techniques need not be hit or miss. It should be governed by a rigorous appraisal of the "marginal ef-

fectiveness" and consequences of alternative methods.

4) The first step in such an appraisal is to reduce the array of available techniques to a few elemental types, best defined and analyzed in terms of the social processes to which they relate, and the varying patterns of social relationships which they involve (thus the subtitle of the book: "Planning and Politico-Economic Systems Resolved into Basic Social Processes"; and the listing, for example, of "Four Basic Control Techniques"). So fashioned, these basic processes and techniques become the common denominators of economic and political analysis and the starting point of a significant venture in political economy.

The reader will recognize from these summary propositions the extent to which the book is an amalgam of established methods and points of view—its borrowings range from the marginal analysis of contemporary economics, and the jargon current among social scientists, to the Fabian emphasis on gradualism and the efficacy of techniques. (It is difficult to forgive the jargon, though no more difficult, I suppose, than to avoid it in these days and with such refractory material. The temptation, certainly, is to write too easily and obscurely, leaving the reader to wonder whether, after all, "the emperor's clothes are woven of naught but artful invention.") The original and real contribution of the authors lies in their resourceful use of familiar materials to provide a new and badly needed analytical system.

Among many uses to which the book should be put, one is to serve as a text in a survey-review course for seniors majoring in economics and political science. Whatever the use and whoever the user, an important bit of advice is to read the "Postscript" first, which is much more significant and helpful than its modest position and title would indicate.

PAUL N. YLVISAKER

Swarthmore College

CRAVEN, WESLEY FRANK, and JAMES LEA CATE (Eds.). *The Army Air Forces in World War II. Vol. V: The Pacific: Matterhorn to Nagasaki, June 1944 to*

August 1945. Pp. xxxvii, 878. Chicago: University of Chicago Press (for the Air Historical Group, USAF), 1953. \$8.50.

In many respects this volume of the projected seven-volume history of the Army Air Forces in World War II is far superior to volumes I, II, and IV, and is only equaled by volume III which deals with the campaign in Europe from January 1944 to May 1945. This is largely accounted for by the fact that it was not until 1944 that the Air Forces overseas had competent historical divisions attached to their headquarters; indeed, General Kenney's Far East Air Forces did not accept the assignment of an historical section until May 1945. Consequently, while the history of the early period of the war is handicapped by a comparative paucity of source materials, volumes III and V are based upon a huge mass of original manuscripts which were available to historians before they were destroyed by hard-pressed adjutant generals who were forced to seek filing space for current papers.

Although this volume presents an excellent account of the most complex and often bewildering campaigns in the Philippines, the naval advance from the Marianas, and the activities of the Air Forces in China and the Burma-India theaters, it is concerned mainly with the strategic bomber offensive against the Japanese homeland. The war against Japan was unique in our whole military history in that it was the only case where the role of the ground soldier was primarily a supporting one. Because of the publicity given to the long and often bitter debate that has raged since the war as to whether the Air Force or the Navy was primarily responsible for the defeat of Japan, one reads this volume in the hope of finding a definite solution to the problem. The extreme supporters of the doctrine of victory through air power alone will get little encouragement out of the contents of the book.

This whole question is analyzed in a brilliantly written "appraisal" in the final 20 pages of the work, and the editors come to the conclusion that it is quite impossible to determine to which Service the credit

should be given. It appears that the basic cause of Japan's failure was the inability of her industrialists to produce war materials in sufficient quantities for a large scale, long protracted struggle. At best they had only 10 per cent of the industrial production of the United States, and this declined rapidly in the latter half of the war. In the words of the editors, "it must be admitted that there would have been real difficulty in studying the effect of strategic bombardment as an isolated problem, for the B-29 offensive—to take but one example—had reached true effectiveness only after a blockade implemented chiefly by U. S. submarines had had a telling effect on Japan's capacity to prosecute the war."

The editors conclude that "if any one factor, aside from the weakness of Japan herself, deserves principal emphasis, it is the high degree of effective joint action achieved among the American armed services."

ARTHUR P. WATTS
Lt-Col. USAFR

Philadelphia, Pennsylvania

LETTERS TO THE EDITOR

Dear Sir:

Reviewing our book, *Anna Ella Carroll and Abraham Lincoln*, T. Harry Williams, in 600 words, says, "Space does not permit analysis" of its case. Had he avoided offensively weighted words and toploftical misstatements, he would have had room.

1. It was not *we* who called Miss Carroll "the great unrecognized member of Lincoln's cabinet." It was the card catalogue of the Library of Congress, which quotes authorities of Lincoln's own time. Can Williams not read quotation marks?

2. Williams, echoing another Williams, says Miss Carroll did not know how her outline of strategy of November 30, 1861, was used. She made no such admission. Guarding her words to Senator Howard, Chairman of the Senate Committee on Military Affairs, in order to get him to commit himself, she drew from him a signed statement to the Senate that she

"had furnished the government with the information which caused the change of the military expedition which was preparing to descend the Mississippi River from that river to the Tennessee" (House Misc. Doc. 58, 45th Cong., 2nd ses.).

3. There is no truth in Williams' statement that "no single contemporary document indicates that Grant advanced because of her influence." On February 20, 1862, Elisha Whittlesey, of the Comptroller's Office, Treasury Department, enclosing copies of Miss Carroll's strategy outline, wrote "They are very extraordinary papers as verified by the results. So far as I know or believe, our unparalleled victories on the Cumberland and Tennessee rivers may be traced to her sagacious observation and intelligence."

Again, Senator Benjamin Wade testified (see p. 323 of our book) that within a few days of the fall of Forts Henry and Donelson, while the movements projected by Miss Carroll were still in progress, "With the knowledge of the author [Miss Carroll] I interrogated witnesses before the Committee to see how far military men were cognizant of the fact." These records were aired in the testimony before the Military Affairs Committee of the House in 1876 (House Misc. Doc. 179). Senator Wade stated in a letter prefixed to House Report No. 386 (see our book, pp. 300-301 and 304) that hearing of Anna's plan from Assistant Secretary of War Scott, he (Wade) himself urged Lincoln to override McClellan and Halleck and put it in execution with secrecy, and appoint Edwin Stanton as Secretary of War to carry out her plan, "since he [Stanton] fully believed it was the only means of safety as I did." Again, the testimony of Colonel Scott (who was Assistant Secretary of War during the Tennessee advance), which he gave seven years after the Civil War, is absolutely explicit (see our book, p. 305).

Will anyone say that the testimony of an official of comparable position made today to the Committee on Military Affairs with regard, say, to the North African campaign, could be dismissed as not "contemporary"?

Williams adds, "in fact, the contemporary documents disprove the Greenbie

thesis." Where are those documents? He cannot produce one. Grant never claimed this strategy. True "almost anyone could have thought of it." But nobody did.

4. Now to our "fascinating use of evidence" in the Conkling speech. Transcripts of this speech were submitted to the Military Affairs Committee, as evidence that that action was taken at once to prepare for future recognition by Congress of Anna's work. Williams' ignorance of this fact does not alter it. It only makes his claim about McClellan more ridiculous.

5. Williams runs riot against our "improbable conversations" which we call synthetic. Our conversations are based on actual words in written documents, or on known actions in similar situations. But Williams prefers improbable generalizations. With Freudian self-confidence, on page 26 of his book, he says: "McClellan would have been a better man had he encountered some humbling reverses in his first battles by actual or possible defeat." Through what special conversation with God does Williams know this? Many generals were defeated without being improved. This is not synthetic. It is pure eyewash.

Our first attempt to answer Williams took us 1,200 words. Since we are given only 550, we shall have to let him go at that. We find it ten times harder to answer his egregious errors in that brief review than he did to cover the errors in our 539 pages.

SYDNEY GREENBIE

Castine, Maine

Dear Sir:

I expected the Greenbies to write a letter protesting my review. They seem to make a practice of protesting reviews that do not accept their claims. I expected the letter to be of the nature it is. I have no desire to get into a squabble with the Greenbies. One cannot argue with people who are dedicated to a case.

T. HARRY WILLIAMS

Louisiana State University

BOOKS RECEIVED

ACKERKNECHT, ERWIN H. *Rudolf Virchow: Doctor, Statesman, Anthropologist*. Pp. xv, 304. Madison: University of Wisconsin Press, 1953. \$5 00.

- ALESEN, L. A. *The Physician's Responsibility as a Leader: A Biologic Interpretation of Economics*. Reprinted from *Northwest Medicine*, Seattle, Oct.-Dec. 1952. Pp. 59. Caldwell, Idaho: The Caxton Printers, 1953. 75 cents.
- Annual Register, The: A Review of Public Events at Home [Britain] and Abroad for the Year 1952*. Edited by Ivison S. Macadam, assisted by Hugh Latimer. Pp. xi, 500. New York: Longmans, Green and Co., 1953. \$12.50.
- BABER, RAY E. *Marriage and the Family*. Pp. xi, 719. New York: McGraw-Hill Book Company, 1953. \$6.00.
- BAILEY, SYDNEY D. *Parliamentary Government in Southern Asia: A Survey of Developments in Burma, Ceylon, India, and Pakistan, 1947-1952*. Pp. 100. New York: Institute of Pacific Relations, 1953. \$2.00.
- BENDIX, REINHARD, and SEYMOUR MARTIN LIPSET (Eds.). *Class, Status and Power: A Reader in Social Stratification*. Pp. 727. Glencoe, Ill.: Free Press, 1953. \$6.00.
- BONTECOUR, ELEANOR. *The Federal Loyalty-Security Program*. Pp. 377. Ithaca, N. Y.: Cornell University Press, 1953. \$5.00.
- BRICE, ANGEL FRANCISCO. *Bolívar, Libertador del Perú*. Pp. 93. Maracaibo, Venezuela: C. A. Tipografía Occidente, Editora de *Diario de Occidente*, 1952. No price.
- CASEY, R. G. *The Conduct of Australian Foreign Policy*. Pp. 26. Melbourne: The Australian Institute of International Affairs (distributed in the U. S. through the Institute of Pacific Relations), 1953. No price.
- COAST, JOHN. *Some Aspects of Siamese Politics*. Pp. iii, 58. New York: International Secretariat, Institute of Pacific Relations, 1953. \$1.50.
- COLE, G. D. H. *Attempts at General Union: A Study in British Trade Union History, 1818-1834*. Pp. viii, 218. New York: St. Martin's Press (distributors for Macmillan & Co., London), 1953. \$3.50.
- COLE, TAYLOR (Ed.). *European Political Systems*. Pp. xii, 699, xxi. New York: Alfred A. Knopf, 1953. \$6.00.
- DABIN, JEAN. *Théorie générale du droit*. Pp. 325. 2d rev. ed. Brussels: Établissements Émile Bruylant, 1953. No price.
- DAIKEN, LESLIE. *Children's Toys Throughout the Ages*. Pp. 208. New York: Frederick A. Praeger, 1953. \$4.95.
- DANDEKAR, V. M. *Report on the Poona Schedules of the National Sample Survey (1950-51)*. Gokhale Institute of Politics and Economics Publication No. 26. Pp. viii, 223, 3. Poona, India: Gokhale Institute of Politics and Economics, 1953. Rs. 6, or 9 s.
- DE SCHWEINITZ, KARL, and KENNETH W. THOMPSON, with the collaboration of PAUL K. HATT. *Man and Modern Society: Conflict and Choice in the Industrial Era*. Pp. xii, 849. New York: Henry Holt and Company, 1953. \$5.25.
- DUNLOP, JOHN T., and JAMES J. HEALY. *Collective Bargaining: Principles and Cases*. Pp. xv, 511. Rev. ed. Homewood, Ill.: Richard D. Irwin, 1953. \$8.00.
- DUTKOWSKI, JEAN-STANISLAW. *L'Occupation de la Crète (1897-1909): Une Expérience d'administration internationale d'un territoire*. Pp. 141. Paris: Éditions A. Pedone (Librairie de la cour d'appel et de l'ordre des avocats), 1952. No price.
- FABRICANT, SOLOMON, assisted by ROBERT E. LIPSEY. *The Trend of Government Activity in the United States since 1900*. Pp. xix, 268. New York: National Bureau of Economic Research, 1952. \$4.00.
- FERBER, ROBERT. *A Study of Aggregate Consumption Functions*. Technical Paper No. 8. Pp. viii, 72. New York: National Bureau of Economic Research, 1953. \$1.50.
- Filosofía y Letras: Revista de la Facultad de Filosofía y Letras*. Nos. 45-46. Enero-Junio 1952. Pp. 396. Mexico, D. F.: Universidad Nacional Autónoma de Mexico, 1952. No price.
- FISHER, SYDNEY NETTLETON (Ed.). *Evolution in the Middle East: Reform, Revolt and Change*. A series of addresses presented at the Seventh Annual Conference on Middle East Affairs, sponsored by The Middle East Institute, March 6-7, 1953. Pp. 97. Washington. The Middle East Institute, 1953. \$1.50.
- FLORIDA STATE UNIVERSITY. *Developments in Education*. FSU Studies, Number IX. Pp. v, 118. Tallahassee: Florida State University, 1953. No price.
- FRIEDRICH, C. J., and J. K. GALBRAITH (Eds.). *Public Policy: A Yearbook of the Graduate School of Public Administration, Harvard University*. Pp. xi, 292. Cambridge, Mass.: Graduate School of Public Administration, 1953. No price.
- GILLEN, J. F. J. *State and Local Government in West Germany, 1945-1953, with Special Reference to the U. S. Zone and Bremen*. Pp. ix, 131. Historical Division, Office of the U. S. High Commissioner for Germany, 1953. No price.
- GRIFFIN, JAMES B. *United States and Canada: Indigenous Period*. Pp. 104. Tacubaya, D. F., Mexico: Instituto Panamericano de Geografía e Historia, 1953. No price.

- HADLOW, LEONARD. *Climate, Vegetation & Man*. Pp. 288. New York: Philosophical Library, 1953. \$4.75.
- HICKMAN, W. BRADDOCK. *The Volume of Corporate Bond Financing Since 1900*. A Study by the National Bureau of Economic Research. Pp. xxxi, 429. Princeton: Princeton University Press, 1953. \$7.50.
- HILLSON, NORMAN. *Alexander of Tunis: A Biographical Portrait*. Pp. 252. London: W. H. Allen (distributed in the U. S. by The British Book Centre), 1953. \$3.50.
- HONIGMANN, JOHN J. *Information for Pakistan*. Report of Research on Intercultural Communication Through Films. Pp. xiv, 276. Durham: Institute for Research in Social Science, University of North Carolina, 1953. No price.
- HOOD, WILLIAM C., and TJALLING C. KOOPMANS (Eds.) *Studies in Econometric Method*. Cowles Commission Monograph No. 14. Pp. xix, 323. New York: John Wiley & Sons, 1953. \$5.50.
- HUME, DAVID. *Hume: Theory of Politics*. Edited by Frederick Watkins. Pp. xxx, 246. Austin: University of Texas Press, 1953. \$2.00.
- INTERNATIONAL LABOUR CONFERENCE, Thirty-Sixth Session. *World Labour Report, 1953: Productivity and Welfare, Economic and Social Survey, Activities of the ILO*. Report of the Director-General of the International Labour Office. Report I Pp. 141. Geneva: International Labour Office (distributed in the U. S. by ILO, Washington, D. C.), 1953. \$1.00.
- JACOB, E. F. *Essays in the Conciliar Epoch*. Pp. viii, 264. 2d enlarged ed. New York: Barnes & Noble, 1953. \$6.00.
- KALIJARVI, THORSTEN V., and ASSOCIATES. *Modern World Politics*. Pp. xi, 660. 3d ed. New York: Thomas Y. Crowell, 1953. \$6.50.
- KANTOR, HARRY. *The Ideology and Program of the Peruvian Aprista Movement*. University of California Publications in Political Science, Vol. IV, ed. by Thomas P. Jenkins, Ernest A. Engelbert, and Foster H. Sherwood. Pp. v, 163. Berkeley: University of California Press, 1953. \$2.00 paper; \$3.00 cloth.
- KEESING, FELIX. *Culture Change: An Analysis and Bibliography of Anthropological Sources to 1952*. Stanford Anthropological Series, Number One. Pp. ix, 242. Stanford, Calif.: Stanford University Press, 1953. \$3.50.
- KNAPLUND, PAUL (Ed.). *British Views on Norwegian-Swedish Problems 1880-1895: Selections from Diplomatic Correspondence*. For Norsk Historisk Kjeldeskrift-Institutt. Pp. xv, 269. Oslo: I Kommissjon Hja Jacob Dybwad, 1952. No price.
- KORBEL, P. *The Development of Slovakia's Constitutional Position*. Pp. 41, iii. New York: National Committee for a Free Europe, 1953. No price.
- LANDHEER, B., and J. L. F. VAN ESSEN (Compilers). *Fundamentals of Public International Law*. Selective Bibliographies of the Library of the Peace Palace. Pp. 85. Leyden: A. W. Sijthoff's Publishing Company, 1953. No price.
- LANDIS, PAUL H. *The Broken Home in Teenage Adjustments: A Study of 4,400 Rural and Urban Young People in Washington*. Pp. 33. Pullman, Wash.: Washington Agricultural Experiment Stations, State College of Washington, Bulletin No. 542, 1953. No price.
- LIEBERMAN, CHAIM. *The Christianity of Sholem Asch: An Appraisal from the Jewish Viewpoint*. Pp. 276. New York: Philosophical Library, 1953. \$3.00.
- LINKLATER, ERIC. *A Year of Space: A Chapter in Autobiography*. Pp. vii, 273. New York: Harcourt, Brace and Company, 1953. \$3.50.
- LUZANNE, CELINA. *Heritage of Buddha: The Story of Siddhartha Gautama*. Pp. x, 290. New York: Philosophical Library, 1953. \$3.75.
- MCMILLAN, T. E., JR. *State Supervision of Municipal Finance*. Public Affairs Series No. 12. Pp. 100. Austin, Tex.: Institute of Public Affairs, The University of Texas, 1953. \$1.00.
- MASSARIK, FRED. *A Report on the Jewish Population of Los Angeles*. Pp. xi, 127. Los Angeles: Los Angeles Jewish Community Council, 1953. No price.
- MATTISON, FRANCES C. (Ed.). *A Survey of American Interests in the Middle East: Covering Business, Philanthropic, Welfare, Educational and Cultural, Governmental and International Organizations with Major Interests in the Middle East*. Pp. xx, 120. Washington: The Middle East Institute, 1953. \$2.75.
- MILNE, ALEXANDER TAYLOR (Compiler). *Writings on British History, 1939*. A Bibliography of Books and Articles on the History of Great Britain from about 450 A.D. to 1914, published during the year 1939, with an Appendix Containing a Select List of Publications in 1939 on British History Since 1914. Pp. 310. London: Jonathan Cape (distributed in the U. S. by The British Book Centre), 1953. \$4.50.
- MORIN, F. ALFRED. *The Serpent and the*

- Satellite*. Pp. 467. New York: Philosophical Library, 1953. \$4.75.
- NORTROP, F. S. C., and MASON W. GROSS (Eds.). *Alfred North Whitehead: An Anthology*. Pp. 928. New York: The Macmillan Company, 1953. \$12.50.
- OGG, FREDERIC A., and HAROLD ZINK. *Modern Foreign Governments*. Pp. xi, 1,005. Rev. ed. New York: The Macmillan Company, 1953. \$6.25.
- PLANK, E. H., with the collaboration of J. W. JACKSON. *Public Finance*. Pp. xi, 772. Homewood, Ill.: Richard D. Irwin, 1953. \$8.00.
- POWYS, JOHN COWPER. *In Spite of: A Philosophy for Everyman*. Pp. 312. New York: Philosophical Library, 1953. \$5.00.
- Reliability and Usability of Soviet Statistics*. A Symposium Reprinted from the April-May and June-July issues of *The American Statistician*. Pp. 23. Washington: American Statistical Association, 1953. No price.
- ROUBICZEK, PAUL. *Thinking in Opposites: An Investigation of the Nature of Man as Revealed by the Nature of Thinking*. Pp. 250. Boston: Beacon Press, 1952. \$3.50.
- ROUNDS, FRANK, JR. *A Window on Red Square*. Pp. 304. Boston: Houghton Mifflin Company, 1953. \$1.00.
- RÜSTOW, ALEXANDER. *Ortsbestimmung der Gegenwart: Eine universalgeschichtliche Kulturkritik*. Zweiter Band: *Weg der Freiheit*. Pp. 710. Erlenbach-Zürich: Eugen Rentsch Verlag, 1952. Paper DM 24.—; cloth DM 28.—.
- SARGENT, PORTER. *The Handbook of Private Schools: An Annual Descriptive Survey of Independent Education*. 1953. Pp. 1,152. 34th ed. Boston, Mass.: Porter Sargent, 1953. \$8.00.
- . *Sargent Guide to Private Junior Colleges and Specialized Schools and Colleges*. 1952. Pp. 256. First ed. Boston, Mass.: Porter Sargent, 1953. Cloth \$2.20; paper \$1.10.
- SARTON, GEORGE. *A Guide to the History of Science: A First Guide for the Study of the History of Science*. With introductory essays on Science and Tradition. Pp. xviii, 316. Waltham, Mass.: Chronica Botanico Co., 1952. \$7.50.
- SECKLER-HUDSON, CATHERYN. *Bibliography on Public Administration Annotated*. Pp. vii, 131. Fourth ed. Washington: American University Press, 1953. \$3.50.
- SHULTZ, GEORGE P., and JOHN R. COLEMAN. *Labor Problems: Cases and Readings*. Pp. xiii, 456. New York: McGraw-Hill Book Company, 1953. \$4.50.
- SHYNE, ANN W. *Statistics of Family Case-work; 1952: Data from 60 Private Member Agencies of the Family Service Association of America*. Pp. 33. New York: Family Service Association of America, 1953. 75 cents.
- SIMPSON, GEORGE EATON, and J. MILTON YINGER. *Racial and Cultural Minorities: An Analysis of Prejudice and Discrimination*. Pp. x, 773. New York: Harper & Brothers, 1953. \$6.00.
- SLOCUM, W. L. *Adjustment of Veteran Trainees to Farming and Rural Life*. Pp. 24. Pullman, Wash.: Washington Agricultural Experiment Stations, State College of Washington, Bulletin No. 541, April 1953. No price.
- SOMERS, GERALD G. *Experience Under National Wage Agreements: The Bituminous Coal and Flint Glass Industries of West Virginia*. West Virginia University Business and Economic Studies, Vol. 2, No. 4, June 1953. Pp. vii, 82. Morgantown, 1953. No price.
- STEINDL, J. *Maturity and Stagnation in American Capitalism*. Oxford University Institute of Statistics Monograph No. 4. Pp. ix, 248. New York: Augustus M. Kelley (distributors for Basil Blackwell, Oxford, England), 1952. \$4.50.
- MAZUR, PAUL. *The Standards We Raise: The Dynamics of Consumption*. Pp. xiii, 173. New York: Harper & Brothers, 1953. \$2.50.
- SZULDRZYŃSKI, J. *The Pattern of Life in Poland*. Vol. XVI: *The Situation of the Catholic Church*. Pp. 61. Paris: Mid-European Research and Planning Centre, 1953. No price.
- TEGNAEUS, HARRY. *Blood-Brothers: An ethnological study of the institutions of blood-brotherhood with special reference to Africa*. Pp. 182. New York: Philosophical Library, 1952. \$12.00.
- THOMPSON, WARREN S., with the assistance of Evangelyn D. Minnis. *Population Problems*. Pp. xiii, 488. 4th ed. New York: McGraw-Hill Book Company, 1953. \$6.50.
- TINTNER, GERHARD. *Mathematics and Statistics for Economists*. Pp. xiv, 363. New York: Rinehart & Company, 1953. \$6.50.
- Trade and Tariff Policy in the National Interest*, A. Prepared by The Advisory Board for Mutual Security. Pp. v, 78. Washington: U. S. Government Superintendent of Documents, 1953. 40 cents.
- United States and Europe, The: A Bibliographical Survey of Thought Expressed in American and British Writings of 1951-1952*. Prepared under the direction of

- Harry J. Krould, Chief European Affairs Division, by Helen F. Conover. Pp. vi, 255. Washington: Library of Congress, 1953. \$1.75.
- VALCARCEL, LUIS E. *Altiplano Andino: Periodo Indigena*. Pp. 141. Tacubaya, D. F., Mexico: Instituto Panamericano de Geografia e Historia, Comision de Historia, 1953. No price.
- VENKATARAMAIA, M. *The General Election in the City of Bombay, 1952*. Pp. viii, 170. Bombay, India: Vora & Co., 1953. \$2.00.
- VARGAS, FRAY JOSE MARIA. *Ecuador: Monumentos historicos y arqueologicos*. Pp. 144. Tacubaya, D. F., Mexico: Instituto Panamericano de Geografia e Historia, Comision de Historia, 1953. \$15.00 (m. mex.).
- WATSON, DAVID LINDSAY. *The Study of Human Nature*. Pp. x, 262. Yellow Springs, O.: Antioch Press, 1953. \$3 50.
- WILLIAMS, HERBERT H. *Foreign Study for Syrians: A Guide to a Long Range Program*. Pp viii, 66. New York: Institute of International Education, 1953. 50 cents.
- . *Syrians Studying Abroad: A Comparison of Factors Influencing the Number of Syrians Studying in the United States and Other Countries*. Pp ii, 20. New York: Institute of International Education, 1952. 30 cents.
- WILLIAMS, WILLIAM APPLEMAN. *American Russian Relations, 1781-1947*. Pp. 367. New York: Rinehart & Company, 1952. \$5.00.

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